

Service Manual

ViewSonic PT810-3

Model No. PT810-3

***21" Digital Controlled Color Monitor
Professional Series***



(Rev. 1 - February 97)

ViewSonic® 20480 E. Business Parkway, Walnut, California 91789 USA - (800) 888-8583

SECTION 12 Electrical Parts List

Model#: PT810-3

NOTE

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

All resistors are in ohms

The components identified by Δ in this manual have been carefully factory selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

The components identified by Δ are critical for safety. Replace only with code number specified

There are some cases the reference number on one board overlaps on the other board, therefore, when ordering parts by the reference number, please include the board name.

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
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DEFLECTION BOARD

PB001	PWB1	<PWB> PBH104-1	9T13104-01	
		<INTEGRATED CIRCUIT>		
IC201	IC	LA7841	9T34429-00	*
IC250	IC	μ PC7912AHF	9T30052-00	
IC251	IC	μ PC7812AHF	9T30036-00	
IC252	IC	μ PC7824AHF	9T30055-00	
IC301	IC	M5218AL	9T34501-00	
		<TRANSISTOR&FET>		
Q301	Transistor	2SD2374A	9T44259-00	*
Q303	Transistor	2SC2240-GR-TPE2	9T42361-50	
Q304	MOS FET	2SK1819-01MR	9T45091-00	*
Q305	MOS FET	2SK2461	9T45014-00	*
Q306	MOS FET	2SK2461	9T45014-00	*
Q307	MOS FET	2SK2461	9T45014-00	*
Q308	MOS FET	2SK2461	9T45014-00	*
Q350	MOS FET	2SJ449	9T45106-00	*
Q351	Transistor	2SC3503-EF	9T42531-00	
Q352	Transistor	2SC2458-Y-TPE4	9T42396-50	
Q353	Transistor	2SA1048-Y-TPE4	9T40209-50	
Q354	Transistor	2SB1548A	9T41110-00	
Q355	Transistor	2SD2374A	9T44259-00	
Q356	Transistor	2SC5301-YB	9T42701-00	*
Q402	MOS FET	2SK2771-01R-F172R	9T45092-00	*
Q450	Transistor	2SC3632	9T42500-00	
Q451	Transistor	2SC4630LS-CB	9T42630-00	
Q452	Transistor	2SC4630LS-CB	9T42630-00	
Q453	Transistor	2SA1968-CB	9T40368-00	
		<DIODE>		
D201	Diode	S5688B-TPA3	9T47050-50	
D202	Diode	S5688B-TPA3	9T47050-50	
D250	Diode	S5688B-TPA3	9T47050-50	
D251	Diode	S5688B-TPA3	9T47050-50	
D252	Diode	S5688B-TPA3	9T47050-50	
D253	Diode	S5688G-TPA3	9T47049-50	
D301	Diode	RK14 LF-A1	9T47250-00	
D302	Diode Zener	RD12EB2-TA11R	9V46072-50	
D303	Diode Zener	RD12EB2-TA11R	9V46072-50	
D304	Diode Zener	RD12EB2-TA11R	9V46072-50	
D305	Diode Zener	RD12EB2-TA11R	9V46072-50	
D306	Diode Zener	RD12EB2-TA11R	9V46072-50	
D350	Diode	1R5GU41 LC7-15A	9T47265-00	*
D351	Diode	1R5GU41 LC7-15A	9T47265-00	*
D352	Diode Zener	RD9.1FB2-TA11R	9V46059-50	*
D353	Diode	RG2A LF-A1	9T47232-01	
D354	Diode	S5688B-TPA3	9T47050-50	

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
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D355	Diode	ERB91-02-L6	9T47292-01	
D356	Diode	ERB91-02-L6	9T47292-01	
D357	Diode	FMQ-G5F5	9T47144-00	
D358	N/A			
D359	Diode	RP-1H	9T47105-00	
D360	Diode	AL01Z-V0	9T47267-50	
D401	Diode Zener	RD12EB2-TA11R	9V46072-50	
D402	Diode	RG4C LF015-308	9T47187-03	
D403	Diode	RG4C LF015-308	9T47187-03	
D404	Diode Zener	RD9.1FB2	9T46359-00	
D405	Diode Zener	RD9.1FB2	9T46359-00	
D406	Diode	RP-1H	9T47105-00	
D407	Diode	RP-1H	9T47105-00	
D408	Diode	EG01C-V0	9T47164-50	
D409	Diode Zener	RD9.1FB2	9T46359-00	
D451	Diode	1S177-TPA7	9T47221-50	
D452	Diode	EG01C-V0	9T47164-50	
D453	Diode	EG01C-V0	9T47164-50	
D455	Diode Zener	RD9.1FB2	9T46359-00	
D456	Diode Zener	RD9.1FB2	9T46359-00	
D457	Diode Zener	RD9.1FB2	9T46359-00	
D458	Diode Zener	RD9.1FB2	9T46359-00	
		<RESISTOR>		
RV401	Variable Resistor	20K	9T50289-00	Δ
RV451	Variable Resistor	500 0.3W B	9T50239-53	
R201	Carbon	33K Ω 1/4W	9V51025-63	
R202	Carbon	1.0K Ω 1/6W	9V51014-51	
R203	N/A			
R204	Carbon	4.7K Ω 1/6W	9V51014-67	
R205	Carbon	2.2K Ω 1/6W	9V51014-59	
R206	Fusible	4.7	9T52951-67	
R207	Fusible	1.0	9T52951-51	
R208	Fusible	10	9T52952-51	
R209	Carbon	1.2K 1/2W	9T51054-53	
R210	Carbon	680 1/2W	9T51053-71	
R211	Metal Oxide	1.0 1W	9T51661-51	
R212	Carbon	22K Ω 1/6W	9V51015-59	
R213	N/A			
R214	Fusible	2.2 1/2W	9T52956-59	
R215	Fusible	2.2 1/2W	9T52956-59	
R252	Metal Oxide	470 3W	9T51703-67	
R253	Metal Oxide	470 3W	9T51703-67	
R301	Metal Oxide	1.8K 3W	9T51704-57	
R302	Carbon	4.7K Ω 1/6W	9V51014-67	
R303	Carbon	6.8K Ω 1/2W	9V51054-71	
R304	Carbon	1.8K Ω 1/6W	9V51014-57	
R305	Carbon	470K Ω 1/6W	9V51016-67	
R306	Carbon	47K Ω 1/6W	9V51015-67	
R307	Carbon	82K Ω 1/6W	9V51015-73	
R308	Carbon	47K Ω 1/6W	9V51015-67	

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Model#: PT810-3

NOTE

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RESISTORS

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The components identified by Δ in this manual have been carefully factory selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

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REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
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DEFLECTION BOARD

<PWB>				
PBC01	PWB1	PBH104-1	9T13104-01	
<INTEGRATED CIRCUIT>				
IC201	IC	LA7841	9T34429-00	*
IC250	IC	μ PC7912AHF	9T30052-00	
IC251	IC	μ PC7812AHF	9T30036-00	
IC252	IC	μ PC7824AHF	9T30055-00	
IC301	IC	M5218AL	9T34501-00	
<TRANSISTOR&FET>				
Q301	Transistor	2SD2374A	9T44259-00	*
Q303	Transistor	2SC2240-GR-TPE2	9T42361-50	
Q304	MOS FET	2SK1819-01MR	9T45091-00	*
Q305	MOS FET	2SK2461	9T45014-00	*
Q306	MOS FET	2SK2461	9T45014-00	*
Q307	MOS FET	2SK2461	9T45014-00	*
Q308	MOS FET	2SK2461	9T45014-00	*
Q350	MOS FET	2SJ449	9T45106-00	*
Q351	Transistor	2SC3503-E/F	9T42531-00	
Q352	Transistor	2SC2458-Y-TPE4	9T42396-50	
Q353	Transistor	2SA1048-Y-TPE4	9T40209-50	
Q354	Transistor	2SB1548A	9T41110-00	
Q355	Transistor	2SD2374A	9T44259-00	
Q356	Transistor	2SC5301-YB	9T42701-00	*
Q402	MOS FET	2SK2771-01R-F172R9T45092-00		*
Q450	Transistor	2SC3632	9T42500-00	
Q451	Transistor	2SC4630LS-CB	9T42630-00	
Q452	Transistor	2SC4630LS-CB	9T42630-00	
Q453	Transistor	2SA1968-CB	9T40368-00	
<DIODE>				
D201	Diode	S5688B-TPA3	9T47050-50	
D202	Diode	S5688B-TPA3	9T47050-50	
D250	Diode	S5688B-TPA3	9T47050-50	
D251	Diode	S5688B-TPA3	9T47050-50	
D252	Diode	S5688B-TPA3	9T47050-50	
D253	Diode	S5688B-TPA3	9T47049-50	
D301	Diode	RK14 LF-A1	9T47250-00	
D302	Diode Zener	RD12EB2-TA11R	9V46072-50	
D303	Diode Zener	RD12EB2-TA11R	9V46072-50	
D304	Diode Zener	RD12EB2-TA11R	9V46072-50	
D305	Diode Zener	RD12EB2-TA11R	9V46072-50	
D306	Diode Zener	RD12EB2-TA11R	9V46072-50	
D350	Diode	1RS5U41 LC7-15A	9T47265-00	*
D351	Diode	1RS5U41 LC7-15A	9T47265-00	*
D352	Diode Zener	RD9.1FB2-TA11R	9V46059-50	*
D353	Diode	RG2A LF-A1	9T47232-01	
D354	Diode	S5688B-TPA3	9T47050-50	

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
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D355	Diode	ERB91-02-L6	9T47292-01	
D356	Diode	ERB91-02-L6	9T47292-01	
D357	Diode	FMQ-G5F5	9T47144-00	
D358	N/A			
D359	Diode	RP-1H	9T47105-00	
D360	Diode	AL01Z-V0	9T47267-50	
D401	Diode Zener	RD12EB2-TA11R	9V46072-50	
D402	Diode	RG4C LF015-308	9T47187-03	
D403	Diode	RG4C LF015-308	9T47187-03	
D404	Diode Zener	RD9.1FB2	9T46359-00	
D405	Diode Zener	RD9.1FB2	9T46359-00	
D406	Diode	RP-1H	9T47105-00	
D407	Diode	RP-1H	9T47105-00	
D408	Diode	EG01C-V0	9T47164-50	
D409	Diode Zener	RD9.1FB2	9T46359-00	
D451	Diode	1SS177-TPA7	9T47221-50	
D452	Diode	EG01C-V0	9T47164-50	
D453	Diode	EG01C-V0	9T47164-50	
D455	Diode Zener	RD9.1FB2	9T46359-00	
D456	Diode Zener	RD9.1FB2	9T46359-00	
D457	Diode Zener	RD9.1FB2	9T46359-00	
D458	Diode Zener	RD9.1FB2	9T46359-00	

<RESISTOR>

RV401	Variable Resistor	20K	9T50289-00	Δ
RV451	Variable Resistor	500 0.3W B	9T50239-53	
R201	Carbon	33K Ω 1/4W	9V51025-63	
R202	Carbon	1.0K Ω 1/6W	9V51014-51	
R203	N/A			
R204	Carbon	4.7K Ω 1/6W	9V51014-67	
R205	Carbon	2.2K Ω 1/6W	9V51014-59	
R206	Fusible	4.7 1/4W	9T52951-67	
R207	Fusible	1.0 1/4W	9T52951-51	
R208	Fusible	10 1/4W	9T52952-51	
R209	Carbon	1.2K 1/2W	9T51054-53	
R210	Carbon	680 1/2W	9T51053-71	
R211	Metal Oxide	1.0 1W	9T51661-51	
R212	Carbon	22K Ω 1/6W	9V51015-39	
R213	N/A			
R214	Fusible	2.2 1/2W	9T52956-59	
R215	Fusible	2.2 1/2W	9T52956-59	
R252	Metal Oxide	470 3W	9T51703-67	
R253	Metal Oxide	470 3W	9T51703-67	
R301	Metal Oxide	1.8K 3W	9T51704-57	
R302	Carbon	4.7K Ω 1/6W	9V51014-67	
R303	Carbon	6.8K Ω 1/2W	9V51054-71	
R304	Carbon	1.8K Ω 1/6W	9V51014-57	
R305	Carbon	470K Ω 1/6W	9V51016-67	
R306	Carbon	47K Ω 1/6W	9V51015-67	
R307	Carbon	82K Ω 1/6W	9V51015-73	
R308	Carbon	47K Ω 1/6W	9V51015-67	

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The components identified by Δ are critical for safety.
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REF. NO.	PARTS NAME	DESCRIPTIONS	CODENO.	REMARKS	REF. NO.	PARTS NAME	DESCRIPTIONS	CODENO.	REMARKS
C353	Elect	10 μ F	200V	9T65908-01			<OTHERS>		
C354	Elect	680 μ F	16V	9T64014-50	T301	Drive Transf	PTR34-08	9T93638-00	
C355	Elect	680 μ F	16V	9T64014-50	T350	H-Output Transf	PTR23-01	9T94341-00	
C356	Polyester	6800PF	400V	9V70161-50	T401	FBT	PCF71-04	9T95264-00	Δ
C357	Polyester	0.47 μ F	50V	9V77436-50	T451	Pulse	PTR01-23	9T94723-00	
C358	Ceramic	2200PF	1KV	9T67747-51	SG401	Spark Gap	DSA-242MA-06	9T92023-00	
C359	Polypropylene	0.15 μ F	400V	9T73503-00	SG451	Surge Protector	DSP-201M-C04F	9T92019-50	
C360	Polypropylene	0.15 μ F	400V	9T73503-00	J452	Board In Connector	SIN-21T-1.8	9T86205-00	
C361	Elect	2.2 μ F	250V	9T62205-55	P201	Connector	1L-SDD-20P-S2T2	9T82115-00	
C362	Polypropylene	1500PF	1.8KV	9T73805-00	P202	Connector	1L-SDD-20P-S2T2	9T82115-00	
C363	Polypropylene	1500PF	1.8KV	9T73805-00	P203	Connector	W-P3005-02	9T81015-00	
C364	Polypropylene	1500PF	1.8KV	9T73805-00	P204	N/A			
C365	Ceramic	330PF	1KV	9V68779-51	P206	Connector	B10B-XH-2	9T86644-00	
C366	Ceramic	330PF	1KV	9V68779-51	P207	Connector	B8B-PH-K	9T86607-00	
C367	Ceramic	2200PF	1KV	9V68722-51	P350	Connector	CM16506-0101	9T87282-00	
C368	Ceramic	1500PF	3KV	9T67766-51	P351	N/A			
C369	Ceramic	68PF	1KV	9V67711-51	P401	Connector	B2P3-VH-B-C	9T86652-01	
C370	Ceramic	82PF	1KV	9T67712-51	P402	Connector	B7B-PH-K	9T86606-00	
C401	Polypropylene	1500PF	1.2KV	9T73207-00	P403	Connector	B3B-PH-K	9T86602-00	
C402	Polyester	1000PF	100V	9T70351-50	P450	Connector	B2P3-VH-B	9T86652-00	
C403	Ceramic	0.01 μ F	2KV	9T67773-51	P451	Connector	B2P3-VH-B-C	9T86652-01	
C408	Polyester	1.5 μ F	250V	9T70817-00					
C409	Polyester	4700PF	200V	9V70409-50					
C412	Elect	4.7 μ F	50V	9V62105-65					
C413	Ceramic	0.1 μ F	25V	9V69998-50					
C415	Ceramic	0.01 μ F	2KV	9T67773-51					
C424	N/A								
C428	N/A								
C429	Ceramic	0.01 μ F	2KV	9T67773-51					
C430	Polyester	1000PF	100V	9T70351-50					
C431	Ceramic	0.01 μ F	2KV	9T67773-51					
C451	N/A								
C452	Ceramic	1000PF	1KV	9T67745-51					
C453	N/A								
C454	Polyester	1000PF	50V	9V70301-50					
C455	Ceramic	1000PF	1KV	9T67745-51					
C456	Ceramic	0.01 μ F	2KV	9T67773-51					
		<COIL>							
L202	Choke Coil			9U46400-00					
L301	Micro Inductor	1.0mH		9U54430-00					
L302	Micro Inductor	8.2mH		9U15454-50					
L350	Micro Inductor	470 μ H		9U05439-00					
L352	InductorBead			9U16521-50					
L353	InductorBead			9U16521-50					
L354	Choke Coil	PCL52-01		9U12231-00					
L355	Linearity Coil	PCL14-33		9U10223-00					
L356	Micro Inductor	3.3mH		9U15449-50					
L357	InductorBead			9U16521-50					
L358	InductorBead			9U16521-50					
L401	InductorBead			9U16521-50					
L402	Micro Inductor	470 μ H		9U15439-50					
L403	Micro Inductor	10 μ H		9U15486-50					
L404	Choke Coil	PCL56-43		9U12443-00					
L450	InductorBead	BL02RN1-R62T4		9U16521-50					
L451	InductorBead	BL02RN1-R62T4		9U16521-50					
L452	InductorBead	BL02RN1-R62T4		9U16521-50					
L453	InductorBead	BL02RN1-R62T4		9U16521-50					

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REF. NO. PARTS NAME DESCRIPTIONS CODE NO. REMARKS

VIDEO BOARD

<PWB>

PB002 PWB PBH057-3 9T13057-03

<IC>

IC801	IC	M52320SP	9T20008-00	#
IC802	IC	M35045-057SP-01	9T20033-00	
IC803	D/A Converter	M62352P	9T39102-00	
IC804	IC	μ PC358C	9T30037-00	
IC805	IC	VP553	9T34444-00	#
IC806	IC	μ PC7812AHF	9T30036-00	
IC807	IC	μ PC7905AHF	9T30054-00	
IC808	IC	μ PC7805AHF	9T30053-00	

<TRANSISTOR>

Q801	Transistor	2SC3732-K/L-T	9V42505-50
Q802	Transistor	2SA1433-E/F-AE	9T40326-50
Q804	Transistor	2SA1433-E/F-AE	9T40326-50
Q806	Transistor	2SA1433-E/F-AE	9T40326-50
Q808	Transistor	2SC4218-E/F-AA	9T42558-50
Q809	Transistor	2SC4218-E/F-AA	9T42558-50
Q811	Transistor	2SC4218-E/F-AA	9T42558-50
Q812	Transistor	2SA1624-E/F-AA	9T40341-50
Q813	Transistor	2SC4218-E/F-AA	9T42558-50
Q814	Transistor	2SA1624-E/F-AA	9T40341-50
Q815	Transistor	2SC4218-E/F-AA	9T42558-50
Q816	Transistor	2SA1624-E/F-AA	9T40341-50

<DIODE>

D801	N/A		
D802	Diode	1SS177-TPA7	9T47221-50
D803	Diode	1SS177-TPA7	9T47221-50
D804	Diode	1SS177-TPA7	9T47221-50
D805	Diode	1SS83-TD	9T47202-50
D806	Diode	1SS83-TD	9T47202-50
D807	Diode	1SS83-TD	9T47202-50
D808	Diode	1SS83-TD	9T47202-50
D809	Diode	1SS83-TD	9T47202-50
D810	Diode	1SS83-TD	9T47202-50
D811	Diode	1SS83-TD	9T47202-50
D812	Diode	1SS83-TD	9T47202-50
D813	Diode	1SS83-TD	9T47202-50
D814	Diode	S5688G-TPA3	9T47049-50
D815	Diode	1SS177-TPA7	9T47221-50
D816	Diode	1SS177-TPA7	9T47221-50
D817	Diode	1SS177-TPA7	9T47221-50
D818	Diode	1SS177-TPA7	9T47221-50
D819	Diode	1SS177-TPA7	9T47221-50
D820	Diode	1SS177-TPA7	9T47221-50
D821	Diode	S5688B-TPA3	9T47050-50
D822	Diode	S5688B-TPA3	9T47050-50
D823	Diode	S5688B-TPA3	9T47050-50
D824	Diode Zener		9V46039-50

<RESISTOR>

R802	Carbon	10 Ω	1/6W	9V51012-51
R804	Carbon	10 Ω	1/6W	9V51012-51
R806	Carbon	10 Ω	1/6W	9V51012-51
R808	Carbon	56K	1/6W	9T51015-69
R810	Carbon	5.6K Ω	1/6W	9V51014-69
R813	Metal	100K Ω	1/6W	9V52006-51

REF. NO. PARTS NAME DESCRIPTIONS CODE NO. REMARKS

R814	Metal	13K	1/6W	9T52005-54
R815	Carbon	270	1/6W	9T51013-61
R816	Carbon	2.2K Ω	1/4W	9V51054-59
R817	Carbon	100 Ω	1/6W	9V51013-51
R818	Carbon	330 Ω	1/6W	9V51013-63
R819	Carbon	820 Ω	1/4W	9V51023-73
R820	Carbon	330 Ω	1/6W	9V51013-63
R821	Carbon	820 Ω	1/4W	9V51023-73
R822	Carbon	330 Ω	1/6W	9V51013-63
R823	Carbon	820 Ω	1/4W	9V51023-73
R827	Metal Oxide	270	1W	9T51663-61
R831	Metal Oxide	270	1W	9T51663-61
R835	Metal Oxide	270	1W	9T51663-61
R836	Carbon	820 Ω	1/6W	9V51013-73
R837	Metal	120	1/6W	9T52003-53
R838	Metal	22K	1/6W	9T52005-59
R839	Carbon	680 Ω	1/4W	9V51023-71
R840	Metal	150K	1/6W	9T52006-55
R841	Carbon	820 Ω	1/6W	9V51013-73
R842	Metal	110	1/6W	9T52003-52
R843	Metal	22K	1/6W	9T52005-59
R844	Carbon	680 Ω	1/4W	9V51023-71
R845	Metal	150K Ω	1/6W	9V52006-55
R846	Carbon	820 Ω	1/6W	9V51013-73
R847	Metal	82	1/6W	9T52002-73
R848	Metal	22K	1/6W	9T52005-59
R849	Carbon	680 Ω	1/4W	9V51023-71
R850	Metal	150K Ω	1/6W	9V52006-55
R851	N/A			
R852	N/A			
R853	N/A			
R854	Metal Glaze	330K	1/4W	9T53601-63
R855	Metal Glaze	330K	1/4W	9T53601-63
R856	Metal Glaze	330K	1/4W	9T53601-63
R857	Solid	100	1/4W	9T59113-01
R858	Solid	100	1/4W	9T59113-01
R859	Solid	100	1/4W	9T59113-01
R860	N/A			
R861	Carbon	470 Ω	1/6W	9V51013-67
R862	Carbon	100 Ω	1/6W	9V51013-51
R863	Carbon	1.0K Ω	1/6W	9V51014-51
R864	Metal	2.4K	1/6W	9T52004-60
R866	Carbon	1.0K Ω	1/6W	9V51014-51
R867	Carbon	1.0K Ω	1/6W	9V51014-51
R868	Carbon	1.0K Ω	1/6W	9V51014-51
R869	Carbon	1.0K Ω	1/6W	9V51014-51
R870	Carbon	1.0K Ω	1/6W	9V51014-51
R871	Carbon	1.0K Ω	1/6W	9V51014-51
R872	Carbon	1.0K Ω	1/6W	9V51014-51
R873	Carbon	10K Ω	1/6W	9V51015-51
R874	Carbon	10K Ω	1/6W	9V51015-51
R875	N/A			
R876	N/A			
R877	N/A			
R878	Carbon	10K Ω	1/6W	9V51015-51
R879	Carbon	39K Ω	1/6W	9V51015-65
R880	Carbon	10K Ω	1/6W	9V51015-51
R883	Metal Glaze	1.0M	1/4W	9T53602-51
R884	Carbon	47K Ω	1/6W	9V51015-67
R885	Metal Glaze	1.0M	1/4W	9T53602-51
R887	Metal	68K	1/6W	9T52005-71
R888	Metal	16K	1/6W	9T52005-56

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Replace only with code number specified

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS	REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
R890	Metal Glaze	2.2M 1/2W	9T53605-59		C835	Plyester	0.1 μ F 250V	9V77550-50	
R891	Metal Glaze	2.2M 1/2W	9T53605-59		C837	Plyester	0.1 μ F 250V	9V77550-50	
R892	Carbon	1.5K Ω 1/5W	9V51014-55		C838	Elect	47 μ F 100V	9T62149-56	
R893	Carbon	90K 1/5W	9T51016-65		C839	Ceramic	4700PF 50V	9T69975-50	
R894	Carbon	68K Ω 1/6W	9V51015-71		C840	Ceramic	0.1 μ F 50V	9T69976-50	
R895	Carbon	1.0K Ω 1/6W	9V51014-51		C841	Elect	1.0 μ F 50V	9T62102-56	
R896	Metal Glaze	100K 1/4W	9T53601-51		C842	Elect	100 μ F 10V	9V62030-65	
R897	Metal Glaze	100K 1/4W	9T53601-51		C843	Ceramic	0.1 μ F 50V	9T69976-50	
R898	Carbon	8.2K Ω 1/6W	9V51014-73		C844	Ceramic	0.1 μ F 25V	9V69998-50	
R899	Carbon	1.5K Ω 1/6W	9V51014-55		C845	Ceramic	0.1 μ F 25V	9V69998-50	
RA801	Carbon	390K 1/6W	9T51016-65		C846	Ceramic	0.1 μ F 25V	9V69998-50	
RA802	Carbon	68K Ω 1/6W	9V51015-71		C847	Ceramic	0.1 μ F 25V	9V69998-50	
RA803	Carbon	1.0K Ω 1/6W	9V51014-51		C849	N/A			
RA804	Metal Glaze	100K 1/4W	9T53601-51		C850	Ceramic	0.01 μ F 2KV	9T67773-51	
RA805	Metal Glaze	100K 1/4W	9T53601-51		C852	Elect	10 μ F 25V	9V62066-65	
RA806	Carbon	8.2K Ω 1/6W	9V51014-73		C853	Elect	1.0 μ F 250V	9T62204-55	
RA807	Carbon	1.5K Ω 1/6W	9V51014-55		C854	Elect	10 μ F 25V	9V62066-65	
RA808	Carbon	390K 1/6W	9T51016-65		C855	Elect	1.0 μ F 250V	9T62204-55	
RA809	Carbon	68K Ω 1/6W	9V51015-71		C856	Elect	10 μ F 25V	9V62066-65	
RA810	Carbon	1.0K Ω 1/6W	9V51014-51		C857	Elect	1.0 μ F 250V	9T62204-55	
RA811	Metal Glaze	100K 1/4W	9T53601-51		C858	Ceramic	4700PF 1KV	9T67768-51	
RA812	Metal Glaze	100K 1/4W	9T53601-51		C860	Ceramic	0.01 μ F 2KV	9T67773-51	
RA813	Carbon	8.2K Ω 1/6W	9V51014-73		C861	Elect	47 μ F 16V	9T62049-56	
RA816	Metal Glaze	820K 1/2W	9T53604-73		C862	Elect	47 μ F 25V	9V62069-65	
RA817	Metal Glaze	100K 1/2W	9T53604-51		C863	Elect	47 μ F 16V	9T62049-56	
RA818	N/A				C864	Elect	47 μ F 25V	9T62069-56	
RA819	Carbon	5.6K 1/4W	9T51024-69		C865	Elect	47 μ F 16V	9T62049-56	
<CAPACITOR>					C866	Elect	47 μ F 25V	9T62069-56	
C801	Plyester	0.01 μ F 50V	9V70313-50		C867	Elect	4.7 μ F 100V	9T62145-56	
C802	Ceramic	0.1 μ F 25V	9V69998-50		C868	Elect	2.2 μ F 100V	9T62143-56	
C803	Ceramic	0.1 μ F 25V	9V69998-50		C870	Elect	4.7 μ F 100V	9T62145-56	
C804	Ceramic	0.1 μ F 25V	9V69998-50		C871	Plyester	1000PF 50V	9V70301-50	
C805	Plyester	0.01 μ F 50V	9V70313-50		C873	Elect	4.7 μ F 100V	9T62145-56	
C806	Ceramic	0.1 μ F 25V	9V69998-50		C874	Polyester	0.1 μ F 100V	9T77513-50	
C807	Ceramic	0.1 μ F 25V	9V69998-50		C878	Elect	220 μ F 6.3V	9V62011-65	
C808	Plyester	0.01 μ F 50V	9V70313-50		C879	Elect	220 μ F 6.3V	9V62011-65	
C809	Ceramic	0.1 μ F 25V	9V69998-50		C880	Elect(BP)	4.7 μ F 50V	9T65196-51	
C810	Ceramic	0.1 μ F 25V	9V69998-50		C881	Elect(BP)	4.7 μ F 50V	9T65196-51	
C811	Ceramic	0.1 μ F 25V	9V69998-50		C882	Elect(BP)	4.7 μ F 50V	9T65196-51	
C812	N/A				C883	Ceramic	0.1 μ F 50V	9T69976-50	
C813	Ceramic	0.1 μ F 25V	9V69998-50		C884	Ceramic	0.1 μ F 100V	9T69955-50	
C814	Elect	10 μ F 25V	9V62066-65		C885	Ceramic	0.1 μ F 100V	9T69955-50	
C815	Ceramic	0.1 μ F 25V	9V69998-50		C886	Ceramic	0.1 μ F 100V	9T69955-50	
C816	Elect	10 μ F 25V	9V62066-65		C887	Ceramic	22PF 50V	9T67216-00	
C817	Ceramic	0.1 μ F 25V	9V69998-50		C888	Ceramic	22PF 50V	9T67216-00	
C818	Elect	10 μ F 25V	9V62066-65		C889	Ceramic	22PF 50V	9T67216-00	
C819	Ceramic	0.1 μ F 25V	9V69998-50		<COIL>				
C820	Ceramic	47PF 50V	9T67220-50		L804	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C821	Ceramic	22PF 50V	9T67216-50		L805	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C822	Polyester	1000PF 100V	9T70351-50		L809	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C823	Ceramic	47PF 50V	9T67220-50		L810	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C824	Ceramic	22PF 50V	9T67216-50		L811	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C825	Polyester	1000PF 100V	9T70351-50		L812	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C826	Ceramic	47PF 50V	9T67220-50		L813	Micro Inductor	LHL08TB471K	9U15439-50	
C827	Ceramic	22PF 50V	9T67216-50		L815	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C828	Polyester	1000PF 100V	9T70351-50		L816	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C829	Elect	220 μ F 25V	9V62071-65		L817	Inductor Bead	BL02RN2-R62T4	9U16523-50	
C830	Ceramic	0.1 μ F 25V	9V69998-50		L818	Micro Inductor	LAL04TB100K	9U15321-51	
C831	Elect	22 μ F 200V	9T64068-50						
C833	Plyester	0.1 μ F 250V	9V77550-50						

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REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
<SURGE PROTECTOR>				
SG801	Surge Protector	DSP-301N-C04F	9T92020-50	
SG802	Surge Protector	DSP-301N-C04F	9T92020-50	
SG803	Surge Protector	DSP-301N-C04F	9T92020-50	
SG804	Spark Gap	AG15PC152FB-K2M9T92016-50		
SG805	Surge Protector	DSP-201M-C04F	9T92019-50	
<OTHERS>				
P801	Connector	B6B-XH-2	9T86649-00	
P802	Connector	B10B-PH-K	9T86609-00	
P803	Connector	B2P35-VH	9T86654-00	
P804	Connector	B7B-XH-2	9T86643-00	
P805	Base Pin	005P-3200	9T87311-00	
P806	Base Pin	005P-3200	9T87311-00	

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
INTERFACE BOARD				
<PWB>				
PB003	PWB	PBH106-0	9T13106-00	
<INTEGRATED CIRCUIT>				
IC101	IC	M52348SP	9T34509-00	
IC102	IC	M52347SP	9T34508-00	
IC103	IC	TC74HC221AP	9T22031-00	
IC105	IC	μ PC7805AHF	9T30053-00	
IC106	HIC	PHC41-01	9T37400-00	
<TRANSISTOR>				
Q101	Transistor	2SC2785-JL/HL-T	9V42449-50	
Q102	Transistor	2SC2785-JL/HL-T	9V42449-50	
Q103	Transistor	2SC2785-JL/HL-T	9V42449-50	
Q104	Transistor	2SC2785-JL/HL-T	9V42449-50	
Q105	Transistor	2SC2785-JL/HL-T	9V42449-50	
Q106	Transistor	2SC2785-JL/HL-T	9V42449-50	
<DIODE>				
D101	Diode	1SS177-TPA7	9T47221-50	
D102	Diode	1SS177-TPA7	9T47221-50	
D103	Diode	1SS177-TPA7	9T47221-50	
D104	Diode	1SS177-TPA7	9T47221-50	
D105	Diode	1SS177-TPA7	9T47221-50	
D106	Diode	1SS177-TPA7	9T47221-50	
D107	Diode	1SS177-TPA7	9T47221-50	
D108	Diode	1SS177-TPA7	9T47221-50	
D109	Diode	1SS177-TPA7	9T47221-50	
D110	Diode	1SS177-TPA7	9T47221-50	
D111	Diode	1SS177-TPA7	9T47221-50	
D112	Diode	1SS177-TPA7	9T47221-50	
D113	Diode Zener	RD5.1EB2-TA11R	9V46035-50	
D114	Diode Zener	RD5.1EB2-TA11R	9V46035-50	
D115	Diode Zener	RD5.1EB2-TA11R	9V46035-50	
D116	Diode Zener	RD5.1EB2-TA11R	9V46035-50	
D117	Diode	1SS177-TPA7	9T47221-50	
D118	Diode	1SS177-TPA7	9T47221-50	
D119	Diode	1SS177-TPA7	9T47221-50	
D120	Diode	1SS177-TPA7	9T47221-50	
D121	Diode	S5688B-TPA3	9T47050-50	
D122	Diode Zener	RD5.1EB2-TA11R	9V46035-50	
D123	Diode	1SS177-TPA7	9T47221-50	
D124	Diode	1SS177-TPA7	9T47221-50	
D127	Diode Zener	RD5.1EB2-TA11R	9V4603550	
D128	Diode Zener	RD5.1EB2-TA11R	9V4603550	
<RESISTOR>				
R101	Metal	75 Ω 1/4W	9V5201272	
R102	Metal	75 Ω 1/4W	9V5201272	
R103	Metal	75 Ω 1/4W	9V5201272	
R104	Carbon	3.9K Ω 1/4W	9V5102465	
R105	Carbon	3.9K Ω 1/4W	9V5102465	
R106	Carbon	100 Ω 1/4W	9V5102351	
R107	Carbon	100 Ω 1/4W	9V5102351	
R108	Carbon	100 Ω 1/4W	9V5102351	
R109	Carbon	1.0K Ω 1/4W	9V5102451	
R110	Carbon	470 Ω 1/4W	9V5102367	

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REF. NO	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
R111	Metal	51K 1/6W	9T5200518	
R114	Carbon	10K Ω 1/6W	9V5101551	
R115	Carbon	10K Ω 1/6W	9V5101551	
R116	Metal	75 Ω 1/4W	9V5201272	
R117	Metal	75 Ω 1/4W	9V5201272	
R118	Metal	75 Ω 1/4W	9V5201272	
R119	Carbon	3.9K Ω 1/4W	9V5102465	
R120	Carbon	3.9K Ω 1/4W	9V5102465	
R121	Carbon	47 Ω 1/4W	9V5102267	
R122	Carbon	47 Ω 1/4W	9V5102267	
R123	Carbon	47 Ω 1/4W	9V5102267	
R124	Carbon	1.0K Ω 1/4W	9V5102451	
R125	Carbon	100 Ω 1/4W	9V51023-51	
R128	Carbon	47K Ω 1/4W	9V51025-67	
R129	Carbon	47K Ω 1/4W	9V51025-67	
R130	N/A			
R132	N/A			
R133	Carbon	3.3K Ω 1/6W	9V51014-63	
R134	Carbon	4.7K Ω 1/6W	9V51014-67	
R135	Carbon	47K Ω 1/6W	9V51015-67	
R136	Carbon	100K Ω 1/6W	9V51016-51	
R137	Carbon	43K 1/6W	9T51015-66	
R138	Carbon	100 Ω 1/6W	9V51013-51	
R139	Carbon	100 Ω 1/6W	9V51013-51	
R140	Carbon	330 Ω 1/6W	9V51013-63	
R143	Carbon	330 Ω 1/6W	9V51013-63	
R144	Carbon	2.2K Ω 1/4W	9V51024-59	
R145	Carbon	1.2K Ω 1/6W	9V51014-53	
R146	Carbon	1.0K Ω 1/6W	9V51014-51	
R147	Carbon	100K Ω 1/6W	9V51016-51	
R148	Carbon	10K 1/6W	9T51015-01	
R149	Carbon	100 Ω 1/6W	9V51013-51	
R150	Carbon	22K Ω 1/6W	9V51015-59	
R151	Carbon	4.7K Ω 1/6W	9V51014-67	
R152	Carbon	4.7K Ω 1/6W	9V51014-67	
R153	Carbon	4.7K Ω 1/6W	9V51014-67	
R154	Carbon	4.7K Ω 1/6W	9V51014-67	
R155	Carbon	470K 1/6W	9T51016-17	

<CAPACITOR>

C101	Plyester	0.01 μ F 50V	9V70313-50
C102	Elect(BP)	47 μ F 10V	9T64059-50
C103	Plyester	0.01 μ F 50V	9V70313-50
C104	Elect(BP)	47 μ F 10V	9T64059-50
C105	Plyester	0.01 μ F 50V	9V70313-50
C106	Elect(BP)	47 μ F 10V	9T64059-50
C107	Plyester	1000PF 50V	9V70301-50
C108	Elect(BP)	3.3 μ F 50V	9T64060-50
C109	Elect(BP)	47 μ F 10V	9T64059-50
C110	Plyester	0.01 μ F 50V	9V70313-50
C111	Elect(BP)	47 μ F 10V	9T64059-50
C112	Plyester	0.01 μ F 50V	9V70313-50
C113	Elect(BP)	47 μ F 10V	9T64059-50
C114	Plyester	0.01 μ F 50V	9V70313-50
C115	Elect(BP)	47 μ F 10V	9T64059-50
C116	Elect(BP)	3.3 μ F 50V	9T64060-50
C117	Elect(BP)	47 μ F 10V	9T64059-50
C118	Ceramic	0.1 μ F 25V	9V69998-50
C119	Elect	47 μ F 25V	9T64063-50
C120	Plyester	0.01 μ F 50V	9V70313-50
C121	Plyester	0.01 μ F 50V	9V70313-50

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
C122	Elect	47 μ F 25V	9T64063-50	
C123	Plyester	0.01 μ F 50V	9V70313-50	
C124	Plyester	0.01 μ F 50V	9V70313-50	
C125	Plyester	0.01 μ F 50V	9V70313-50	
C126	Elect	47 μ F 25V	9T64063-50	
C127	Plyester	0.01 μ F 50V	9V70313-50	
C128	Elect(BP)	3.3 μ F 50V	9T64060-50	
C129	Elect(BP)	3.3 μ F 50V	9T64060-50	
C130	Elect(BP)	47 μ F 10V	9T64059-50	
C131	Polyster	0.068 μ F 50V	9T70323-50	
C132	Elect	10 μ F 25V	9T64062-50	
C134	Ceramic	220PF 50V	9T67268-50	
C135	Elect	100 μ F 16V	9T64064-50	
C136	Ceramic	100PF 50V	9V67274-50	
C138	Elect	220 μ F 16V	9T64061-50	
C139	Ceramic	0.1 μ F 25V	9V69998-50	
C140	Elect	100 μ F 16V	9T64064-50	
C142	Ceramic	0.1 μ F 25V	9V69998-50	
C143	Ceramic	0.1 μ F 25V	9V69998-50	
C145	Plyester	1000PF 50V	9V70301-50	
C146	Plyester	1000PF 50V	9V70301-50	
C149	Ceramic	0.1 μ F 25V	9V69998-50	
C150	Ceramic	0.1 μ F 25V	9V69998-50	
C151	Ceramic	0.1 μ F 25V	9V69998-50	
C152	Elect	220 μ F 16V	9T64061-50	
C153	Polyster	0.1 μ F 50V	9T77428-00	

<CONNECTOR>

P101	BNC CONNECTOR	YKF31-0008	9T88502-00
P102	BNC CONNECTOR	YKF31-0008	9T88502-00
P103	BNC CONNECTOR	YKF31-0008	9T88502-00
P104	BNC CONNECTOR	YKF31-0008	9T88502-00
P105	BNC CONNECTOR	YKF31-0008	9T88502-00
P106	Connector	D02 M15STF-26L9-2	9T88734-00
P107	Connector	S6B-XH-A	9T86676-00
P108	Connector	TC57689-01-201	9T87711-00
P109	Connector	IL-FPC-26SL-N	9T82127-00
P110	Connector	S10B-PH-K	9T86623-00

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REF. NO. PARTS NAME DESCRIPTIONS CODE NO. REMARKS
SW REGULATOR SUPPLY BOARD

<PWB>				
PB004	PWB	PBH042-S	9T13042-05	
<INTEGRATED CIRCUIT>				
IC901	IC	STR-D1706(LF904)	9T33222-00	Δ #
IC902	IC	STR-S6709A(LF953)	9T33223-00	Δ #
IC951	IC	SI-3050C	9T33243-00	
IC952	IC	SE140N-LF4	9T33202-00	

<TRANSISTOR>				
Q901	Transistor	2SD1312-L-T	9T44251-50	
Q902	Transistor	2SC2925S-TA	9T42461-50	
Q951	Transistor	2SC2458-Y-TPE4	9T42396-50	
Q952	Transistor	2SC2458-Y-TPE4	9T42396-50	
Q953	Transistor	2SC2458-Y-TPE4	9T42396-50	
Q954	Transistor	2SC2925S-TA	9T42461-50	

<DIODE>				
D901	Diode Bridge	RBV-506 LF-B	9T47369-00	
D902	Diode	EM2A LF-F4	9T47055-00	
D903	Diode	FMU-G16S	9T47143-00	
D904	Diode	EG01-V0	9T47246-50	
D905	Diode	EG01C-V0	9T47164-50	
D906	Diode	AU01Z-V0	9T47160-50	
D907	Diode	AU01Z-V0	9T47160-50	
D908	Diode Zener	RD7.5EB2-TA11R	9V46051-50	
D909	Diode	EG01-V0	9T47246-50	
D910	Diode	EG01C-V0	9T47164-50	
D911	Diode	1H46-TPA3	9T47174-50	
D912	Diode	ERA91-02 V3	9T47093-50	
D913	Diode	AK04 V0	9T47229-50	
D914	Diode Zener	RD6.8EB2-TA11R	9V46047-50	
D916	Diode Zener	RD18FB2-22M	9V46388-01	
D917	Diode	EG01-V0	9T47246-50	
D918	Diode Zener	RD18FB2-22M	9V46388-01	
D921	Diode	ERA91-02 V3	9T47093-50	
D951	Diode	5DL2CZ47A	9T47264-00	
D952	Diode	ERA15-01 V3	9T47086-50	
D953	Diode Zener	RD3.5EB2-TA11R	9V46021-50	
D954	Diode	ERA15-01 V3	9T47086-50	
D955	Diode	AK04 V0	9T47229-50	
D956	Diode	ERA15-01 V3	9T47086-50	
D957	Diode	RU4C LF015-308	9T47192-04	
D958	Diode Zener	RD18EB2-TA11R	9T46088-50	
D959	Diode	RU3AM LF-C4	9T47173-01	
D960	Diode	ERB93-02 L6	9T47089-00	
D961	Diode Zener	RD8.2EB1-TA11R	9V46054-50	
D962	Diode	ERB93-02 L6	9T47089-00	
D963	Diode	ERA15-01 V3	9T47086-50	

<PHOTO COUPLER>				
PH901	Photo Coupler	TLP721F(D4-GR)	9T49118-00	
PH902	Photo Coupler	TLP721F(D4-GR)	9T49118-00	
PH903	Photo Coupler	150mA 400V	9T49116-00	

<RESISTOR>				
R901	Metal Glaze	680K 1/2W	9T53604-71	
R902	Cement	3.9 5W	9T52559-15	
R903	Cement Resistor with Fuse	3.9 5W 9T59579-00		
R904	Cement	1.5 10W	9T59575-01	

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
R905	Fusible	18 1/4W	9T52952-57	
R906	Metal Glaze	270K 1/2W	9T53604-61	
R907	Metal Glaze	270K 1/2W	9T53604-61	
R908	Metal	100K 2W	9T51676-51	
R909	Metal	150 1W	9T51663-55	
R910	Fusible	2.2 1/4W	9T52951-59	
R911	Fusible	2.2 1/4W	9T52951-59	
R912	Metal	2.2 1W	9T51661-59	
R913	Metal	100K 2W	9T51676-51	
R914	Metal	100K 2W	9T51676-51	
R915	Fusible	0.1 1/4W	9T59710-50	
R916	Fusible	0.1 1/4W	9T59710-50	
R917	Fusible	47 1/4W	9T52952-67	
R918	Carbon	10K 1/2W	9T51055-51	
R919	Carbon	1.8K Ω 1/4W	9V51024-57	
R920	Carbon	1.0K Ω 1/4W	9V51024-51	
R921	Metal	68K 2W	9T51675-71	
R922	Metal	68K 2W	9T51675-71	
R923	Carbon	27K Ω 1/6W	9V51015-61	
R924	Carbon	4.7K Ω 1/6W	9V51014-67	
R925	Carbon	27K Ω 1/6W	9V51015-61	
R926	Carbon	820 Ω 1/6W	9V51013-73	
R927	Metal	10 3W	9T51682-51	
R928	Metal	0.47 1W	9T51660-67	
R929	Carbon	3.9K Ω 1/4W	9V51024-65	
R930	Cement	0.15 3W	9T52555-05	
R931	Carbon	100 Ω 1/4W	9V51023-51	
R932	Carbon	1.0K Ω 1/6W	9V51014-51	
R951	Carbon	3.3K Ω 1/6W	9V51014-63	
R952	Carbon	47K Ω 1/6W	9V51015-67	
R953	Carbon	100 Ω 1/6W	9V51015-51	
R954	Carbon	560 Ω 1/4W	9V51023-69	
R955	Carbon	15K Ω 1/4W	9V51025-55	
R956	Carbon	330 Ω 1/4W	9V51023-63	
R957	Metal	1.3K 1/6W	9T52004-54	
R958	Fusible	0.82 1/2W	9T59713-51	
R959	Metal	5.6 2W	9T51671-69	
R960	Metal	5.6 2W	9T51671-69	
R961	Metal	470 Ω 1/6W	9V52003-67	
R962	Metal	1.8K Ω 1/6W	9V52004-57	
R963	Fusible	0.1 1/4W	9T59710-50	
R964	Carbon	8.2K 1/4W	9T51024-73	
R965	Carbon	470 Ω 1/4W	9V51023-67	
R966	Metal	47K Ω 1/4W	9V52015-67	
R967	Metal	2.4K Ω 1/4W	9V52014-60	
R968	Fusible	0.1 1/4W	9T59710-50	
R969	Carbon	1.5K Ω 1/6W	9V51014-55	
R971	Fusible	3 1/4W	9T52952-63	
R972	Fusible	0.1 1/4W	9T59710-50	
R973	Carbon	33 1/2W	9T51052-63	

<THERMISTOR>				
TH901	Posistor	9.2 270V	9T48816-00	

<CAPACITOR>				
C901	Plyester	0.47 μ F	250V	9T79126-00
C902	Plyester	0.47 μ F	250V	9T79126-00
C903	Ceramic	4700PF	400V	9T69949-50
C904	Ceramic	4700PF	400V	9T69949-50
C905	Polypropylene	0.47 μ F	400V	9T73509-00
C906	Polypropylene	1.0 μ F	400V	9T73443-00

The components identified by Δ are critical for safety.
Replace only with code number specified

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
C907	Elect	560 μ F 400V	9T64057-00	
C908	Polyester	0.1 μ F 400V	9T77587-50	
C909	Ceramic	0.01 μ F 2KV	9T57773-51	
C910	Polyester	0.068 μ F 50V	9T70323-50	
C911	Elect	100 μ F 16V	9T64042-50	
C912	Elect	220 μ F 16V	9T64043-50	
C913	Polyester	0.033 μ F 630V	9T77610-50	
C914	Elect	47 μ F 63V	9T62129-56	
C915	Polyester	1000PF 50V	9V70301-50	
C916	Elect	220 μ F 25V	9T64044-50	
C917	Elect	120 μ F 35V	9T64069-50	
C918	Polyester	1000PF 50V	9V70301-50	
C919	Polyester	0.1 μ F 50V	9V70325-50	
C920	Elect	220 μ F 25V	9T64023-50	
C921	Polypropylene	2200PF 1.2KV	9T73209-00	
C951	Elect	1200 μ F 16V	9T64045-50	
C952	Elect	680 μ F 16V	9T64014-50	
C953	Elect	470 μ F 10V	9T62033-56	
C954	Elect	220 μ F 16V	9T64043-50	
C955	Elect	100 μ F 10V	9T64048-50	
C956	Elect	220 μ F 200V	9T64071-00	
C957	Elect	100 μ F 200V	9T64012-00	
C958	Elect	1000 μ F 6.3V	9V62014-65	
C959	Elect	220 μ F 6.3V	9V62011-65	
C960	Elect	220 μ F 100V	9T6592X-00	
C961	Elect	100 μ F 100V	9T65885-50	
C962	N/A			
C963	Elect	1000 μ F 25V	9T64049-00	
C964	Elect	820 μ F 25V	9T64025-50	
C965	Elect	1000 μ F 25V	9T64049-00	
C966	Elect	820 μ F 25V	9T64025-50	
<COIL>				
L901	Choke Coil	5528V-R20130	9U14670-00	
L902	Coil	SN10-50CJ	9U14672-00	
L903	Inductor Bead	BL02RN2-R62T4	9U16523-50	
L904	Inductor Bead	BL02RN2-R62T4	9U16523-50	
L951	Micro Inductor	EL0607RA-150K	9U54095-00	
L952	Micro Inductor	EL0607RA-150K	9U54095-00	
L953	Micro Inductor	EL0607RA-150K	9U54095-00	
L954	Micro Inductor	EL0607RA-150K	9U54095-00	
L955	Micro Inductor	EL0607RA-150K	9U54095-00	
L956	Micro Inductor	EL0607RA-150K	9U54095-00	
L957	Inductor Bead	BL02RN2-R62T4	9U16523-50	
T901	Switching Transf	PTR01-20	9T94720-00	Δ
T902	Switching Transf	PTR01-21	9T94721-00	
T903	Switching Transf	PTR66-04	9T94934-00	Δ
<RELAY>				
K901	Relay	DC6V	9T91506-00	
<FUSE>				
F901	Fuse	5A 250V	9V91198-00	
F902	Fuse	5A 250V	9V91198-00	
<FUSE HOLDER>				
FH901	Fuse Holder	PFC5000-0202	9T90986-50	

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
FH902	Fuse Holder	PFC5000-0202	9T90986-50	
<OTHERS>				
P901	Connector	B2P3-VH-B-R	9T86652-02	
P902	Connector	B2P3-VH-B	9T86652-00	
P903	Connector	B4P7-VH-B	9T86657-00	
P904	Connector	B2P3-VH-B-C	9T86652-01	
P905	Connector	B2P3-VH-B-C	9T86652-03	
P951	Connector	B8B-PH-K	9T86607-00	
P952	Connector	B7B-XH-2	9T86643-00	
P953	Connector	B10B-XH-2	9T86644-00	

SWITCH BOARD

<PWB>				
PB005	PWB	PBH071-0	9T13071-00	
<DIODE>				
D703	Diode	5ML1616C(NTP4-DLB)	9T48435-50	
<RESISTOR>				
R701	Carbon	330 Ω 1/3W	9V51053-63	
R702	Carbon	1.5K 1/4W	9T51024-55	
R703	Carbon	10K Ω 1/6W	9V51015-51	
R704	Carbon	10K Ω 1/6W	9V51015-51	

<CONNECTOR>				
P703	Connector	S10B-PH-K	9T86625-00	

PWM BOARD

<PWB>				
PB006	PWB	PSH103-1	9T13103-01	
<INTEGRATED CIRCUIT>				
IC751	IC	μ PC4064C	9T50056-00	
IC752	IC	μ PC393C	9T50057-00	
<TRANSISTOR>				
Q751	Transistor	2SC2785-JL/HL-T	9V42449-50	
Q752	Transistor	2SC2785-JL/HL-T	9V42449-50	
Q753	Transistor	2SA1175-JL/HL-T	9V40251-50	

<DIODE>				
D751	Diode	1SS177-TPA7	9T47221-50	
D752	Diode	1SS177-TPA7	9T47221-50	

<RESISTOR>				
R751	Carbon	1.2K Ω 1/6W	9V51014-53	
R752	Carbon	47K Ω 1/6W	9V51015-67	
R753	Carbon	47K Ω 1/6W	9V51015-67	
R754	Carbon	1.0K Ω 1/6W	9V51014-51	
R755	Carbon	1.0K Ω 1/6W	9V51014-51	
R757	Carbon	1.0K Ω 1/6W	9V51014-51	
R758	Carbon	1.0K Ω 1/6W	9V51014-51	
R759	Carbon	1.0K Ω 1/6W	9V51014-51	
R760	Carbon	4.7K Ω 1/6W	9V51014-67	
R761	Carbon	5.6K Ω 1/6W	9V51014-69	
R762	Carbon	1.0M Ω 1/4W	9V51027-51	
R763	Carbon	1.0K Ω 1/6W	9V51014-51	
R764	Carbon	1.0K Ω 1/6W	9V51014-51	

The components identified by Δ are critical for safety.
Replace only with code number specified

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
R765	N/A			
R766	Carbon	1.0K Ω 1/5W	9V51014-51	
R767	Carbon	15K Ω 1/5W	9V51015-55	
R768	Carbon	110 Ω 1/6W	9V51013-51	
R769	Carbon	10 Ω 1/5W	9V51012-51	
R771	Carbon	8.2K Ω 1/5W	9V51014-73	
R772	Carbon	100 Ω 1/5W	9V51013-51	
R773	Carbon	100 Ω 1/5W	9V51013-51	
R774	Carbon	1.0K Ω 1/5W	9V51014-51	

<CAPACITOR>

C751	Elect	100 μ F 35V	9V62090-65	
C752	Elect	47 μ F 50V	9V62109-65	
C753	Ceramic	0.1 μ F 25V	9V69998-50	
C754	Elect	22 μ F 25V	9V62068-65	
C756	Ceramic	0.1 μ F 25V	9V69998-50	
C757	N/A			
C758	Ceramic	220PF 50V	9T67268-50	
C759	N/A			
C760	Ceramic	0.1 μ F 25V	9V69998-50	
C761	Ceramic	100PF 50V	9T67224-50	
C762	Elect	100 μ F 35V	9V62090-65	
C763	TF2227	0.1 μ F 50V	9T77428-50	
C764	Elect	220 μ F 6.3V	9V62011-65	

<OTHERS>

L751	Micro Inductor	100 μ H	9L15419-50	
P751	Connector	B7B-PH-K	9T86606-00	
P752	Connector	B3B-PH-K	9T86602-00	

MCU

U001	MCU Unit	MCU16-A40	5T19240-04	Δ
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BODY

L001	Rotation Coil	PCL01-68	8F81447-00	
CA001	AC Inlet ASSY	PZE32-136C885650		
CA002	GND ASSY	PZE42-48	6C88976-00	
CA003	CRT-GND ASSY	PZE41-47	6C88930-00	
CA004	GND ASSY 2	PZE42-13C	6C88810-00	
CA005	GND ASSY 1	PZE42-13A	6C88804-00	
CA006	GND ASSY 2	PZE42-13C	6C88810-00	
CA007	GND ASSY	PZE42-50	6C88874-00	
CA008	Cable ASSY	PZE32-112	6C88976-00	
CA011	GND-ASSY	PZE42-46	6C88954-00	
CA012	GND-ASSY	PZE42-46	6C88954-00	
CA013	AC Cord Set	5VTSX16AWG105C1YP	9U23443-00	
CA014	AC Cord	PZE11-125	9U23436-00	
CA015	Signal cable ASSY	SS-FD-001	9U29114-00	
W001	Leafcon	TFL-125K-26-200	3A85262-00	
V001	CRT	M50LJG39X28	9T03755-00	Δ
DG001	Degauss Coil	PCL63-11	8F81440-00	
Z001	HV CableHolder	3-704-372-01	9W70404-01	
Z002	Core	BF30816 \times 28 \times 9	9T97902-00	
Z003	SK Binder	SKB-100	9U21180-00	
Z004	Cable Clip	NO.2047	9U21230-00	
Z005	Parts Lock	NO.61	9U21242-00	
Z006	Clip	NO.166	9U20436-00	

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SECTION 1 : SAFETY WARNING

CAUTION: No work should be attempt on an exposed monitor chassis by anyone not familiar with servicing procedures and precautions.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SPECIFIED PARTS WHOSE PART NUMBERS APPEARS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY VSC. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

1.1 SAFETY CHECK-OUT:

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

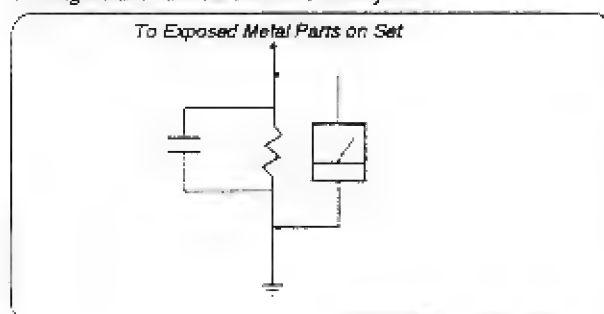
1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounding hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the +B and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.

1.2 LEAKAGE TEST

The AC leakage from any exposed metal parts to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.

2. A battery-operates AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.



1.3 HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60-100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential.

1.4 PRECAUTIONS

1.4.1 CRT REPLACEMENT

Extreme care should be used in handling the CRT as rough handling may cause it to implode due to high vacuum pressure. Do not nick or scratch glass or subject it to any undue pressure in removal or installation. Use goggles and heavy gloves for protection. Be sure to disconnect the monitor from all external power sources. Discharge the CRT by shorting the anode connection to chassis ground (Not cabinet or other parts) before CRT removing. The CRT must be replace with the same type of the CRT for implosion protection and X-ray protection. Do not remove the deflection yoke and /or convergence / purity rings. The new CRT and deflection yoke are matched at the factory, which includes all required convergence / purity adjustment.

1.4.2 Power Transistor Replacement

When replacing a power transistor with heatsink. Silicone grease should be applied evenly to the transistor nuts heatsink. The transistor mounting nuts must be tight before soldering the transistor leads. These insure proper cooling and electrical connections and mechanical security. Non-compliance these instructions can result in failure of the transistor and / or relates components.

1.4.3 Component Removal

When removing a component from a circuit board, care should be taken to prevent lifting of the coil from a circuit board. An iron temperature should be controlled to the proper temperature. Apply the iron only long enough to melt the solder and draw it away.

1.4.4 X-radiation

Warning: The only potential source of X-Radiation is the picture tube. However when the high voltage circuitry is operating properly there is no possibility of X-Radiation problem. The basic precaution which must be exercised is to keep the high voltage at the following factory-recommended level 26.75 KV. NOTE: It is important to use an accurate periodically calibrated high voltage meter.

SECTION 2 SPECIFICATIONS

CRT	Size: 21inch	Phosphor: Short persistence (p22)
	AG pitch: 0.28mm	face treatment: K-Coat / TCO Coat
	Total Faceplate Transmission: K-Coat: 39%, TCO-Coat: 36%	
Resolution	640dot x 350line to 1600dot x 1200 line	
Scanning frequency	Horizontal: 30kHz - 95kHz -up 96kHz as functionally	
	vertical: 50 - 160Hz	
Display size	380mm (H) x 285mm (V)	

Number of preset channels 32 channels max.

Preset signal Channel 1 to 13 are original preset at the factory settings.

Preset at the factory settings

ch.	resolution	fH(kHz)	fV(Hz)	Remarks	ch.	resolution	fH(kHz)	fV(Hz)	Remarks
1	1280x1024	79.976	75.025	VESA 1024/75Hz	9	1024x768	60.24	74.93	MAC 768/75Hz
2	1024x768	60.023	75.029	VESA 768/75Hz	10	1024x768	68.677	84.997	VESA 768/85Hz
3	640x350	31.47	70.09	VGA 350L Ind.	11	1152x870	68.68	75.06	MAC 870/75Hz
4	640x400	31.47	70.09	VGA 400L Ind.	12	1280x1024	91.146	85.024	VESA 1024/85Hz
5	640x480	31.47	59.94	VGA 480L Ind.	13	1600x1200	93.75	75.00	VESA1200L/75Hz
6	800x600	46.875	75.00	VESA 600L/75Hz					
7	800x600	53.674	85.061	VESA 600L/85Hz					
8	832x624	49.724	74.55	MAC 624L/75Hz					

Signal input	Types of signal:	Sync. on Green, Composite Sync., Separated Sync.
	Frequency:	30 to 95 kHz (Horizontal), 50 to 160Hz (Vertical)
	Video signal:	R,G,B analogue, 0.714Vp-p positive, Input impedance: 75 Ω
	Sync. signal:	1.0Vp-p to 5.5Vp-p positive or negative
	Connector:	BNC or 15 pins mini D-sub type (by Inch screw)

Pin assignment (15pins mini D-sub type)



Rear view of connector

1: R	2: G	3: B	4: GND	5: GND
6: R-GND	7: G-GND	8: B-GND	9: NC	10: HS-GND
11: VS-GND	12: DDC	13: HS/VS	14: VS	15: DDC

Power	Input voltage:	AC90 to 132V or AC180 to 264V
	Frequency:	50/60Hz
	Power consumption:	150W typ.
Maximum Luminance output	120cd/m ²	
Screen Distortion	Within 2mm	
Screen Linearity	Maximum 7%	
Misconvergence	Within 0.3mm (Circular area with a diameter of equal to the vertical size)	
	Within 0.4mm (Overall specified screen size)	
video bandwidth	120MHz	
Video input connectors	15pin D-Type connector and BNC connector (R,G,B,HS,VS)	
	(Automatic selection at power on and able to change by front panel)	
National Agency Approvals	Safety:	IEC950 (TÜV Rheinland, GS mark, TÜV ergonomics),UL1950, CSA C22.2 NO.950
		Nordic Regulations (SEMKO)
	EMI:	FCC Class B, TÜV CE/EMC,
	ELF/VLF:	MPR-II, TCO
USER Controls	Luminance:	Contrast, Brightness
	Screen Size/Position:	Horizontal Screen Size and Position, Vertical Screen size and Position.
	Screen Distortion:	Pincushion, trapezoid, Parallel, Bow, HourGlass, Hooking)
	Screen Tilt:	Screen Tilt Adjustment
	Degauss:	Manual and Automatic Degaussing
	Color control:	Selectable of 3 colour balance (9300K, 6500K, 5500K)and adjustable
	Image Control:	Moire reduction, H/V Static Convergence
	Focus Control:	Horizontal Focus, Vertical Focus
Power Saving	suspend mode:	Max 15W
	off mode:	Max 8W
Servicing Control	External communication connector on the rear panel (RS-232C Compatible)	
	Control software will be provided.	
Dimensions	496mm (W) x 491mm (H) x 520mm (D)	
Weight	34 kg (Approx.)	
Tilt / Swivel stand	Tilted: 12 ° (up) 5 ° (down), Swiveled: 90 ° (left) 90 ° (right)	
Ambience	Temperature: 0°C to 40°C, Humidity: 20% to 80% (No dew condensation)	
Accessories	Power Cord, VGA signal cable, User's Manual, Mac Adapter, Warranty Card	

2.2 Detailed Timing specifications of preset

Preset CH Number	1	2	3	4	5	6	7	8	9	10
Preset Name	1280x1024 75Hz	1024x768 75Hz	640x350 70Hz	640x400 70Hz	640x480 60Hz	800x600 75Hz	800x600 85Hz	832x624 75Hz	1024x768 75Hz	1024x768 85Hz
Resolution (HzV)	1280x1024	1024x768	640x350	640x400	640x480	800x600	800x600	832x624	1024x768	1024x768
Dot Clock (MHz)	135.000	78.750	25.175	25.175	25.175	49.5	56.25	57.283	80.00	94.500
Horizontal										
H-Freq. (kHz)	79.976	50.023	31.47	31.47	31.47	48.875	53.674	49.724	60.24	68.677
H-Total (Dots)	1688	1312	600	800	800	1056	1048	1152	1328	1376
H-Front porch (Dots)	16	16	16	16	15	15	32	32	32	48
H-Sync width (Dots)	144	96	96	96	96	80	64	64	96	96
H-Back porch (Dots)	248	176	48	48	48	160	152	224	176	208
H-blanking (Dots)	408	288	160	160	160	256	248	320	304	352
H-Active (Dots)	1280	1024	640	640	640	800	600	832	1024	1024
Vertical										
Vertical Freq (Hz)	75.025	75.029	70.09	70.09	59.94	75.00	85.061	74.55	74.93	84.967
V-Total (Line)	1066	800	449	449	525	625	631	667	804	808
V-Front porch (Line)	1	1	37	12	10	1	1	1	3	1
V-Sync. width (Line)	3	3	2	2	2	3	3	3	3	3
V-Back porch (Line)	38	28	50	35	33	21	27	39	30	36
V-blanking (Line)	42	32	99	48	45	25	31	43	36	40
V-Active (Line)	1024	768	350	400	480	600	600	624	768	768
Sync.										
H-polarity/V-polarity	POS/POS	POS/POS	POS/NEG	NEG/NEG	NEG/NEG	POS/POS	POS/POS	NEG/NEG	NEG/NEG	POS/POS
Scanning mode	NON INTER	NON INTER	NON INTER	NON INTER	NON INTER	NON INTER	NON INTER	NON INTER	NON INTER	NON INTER
Comment	VESA 1024/75Hz	VESA 768/75Hz	VGA 350L IND	VGA 400L IND	VGA 480L IND	VESA 600/85Hz	VESA 600/85Hz	MAC 624L 75Hz	Mac 768L 75Hz	VESA 768/85Hz

Preset CH Number	11	12	13	14	15	16	17	18	19	20
Preset Name	1152x870 75Hz	1280x1024 85Hz	1600x1200 75Hz							
Resolution (HzV)	1152x870	1280x1024	1600x1200							
Dot Clock (MHz)	100.00	157.500	202.50							
Horizontal										
H-Freq. (kHz)	68.68	91.146	93.750							
H-Total (Dots)	1456	1728	2160							
H-Front porch (Dots)	32	48	64							
H-Sync width (Dots)	128	160	192							
H-Back porch (Dots)	144	240	304							
H-blanking (Dots)	304	448	560							
H-Active (Dots)	1152	1280	1600							
Vertical										
Vertical Freq (Hz)	75.06	85.024	75.00							
V-Total (Line)	915	1072	1250							
V-Front porch (Line)	3	1	1							
V-Sync. width (Line)	3	3	3							
V-Back porch (Line)	39	44	46							
V-blanking (Line)	45	48	50							
V-Active (Line)	870	1024	1200							
Sync.										
H-polarity/V-polarity	NEG/NEG	POS/POS	POS/POS							
Scanning mode	NON INTER	NON INTER	NON INTER							
Comment	MAC 870/75Hz	VESA 1024/85Hz	VESA 1200/70Hz							

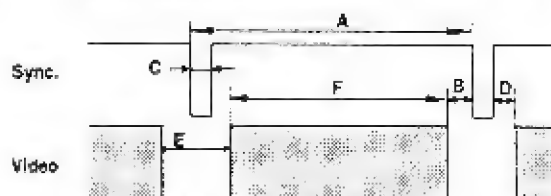
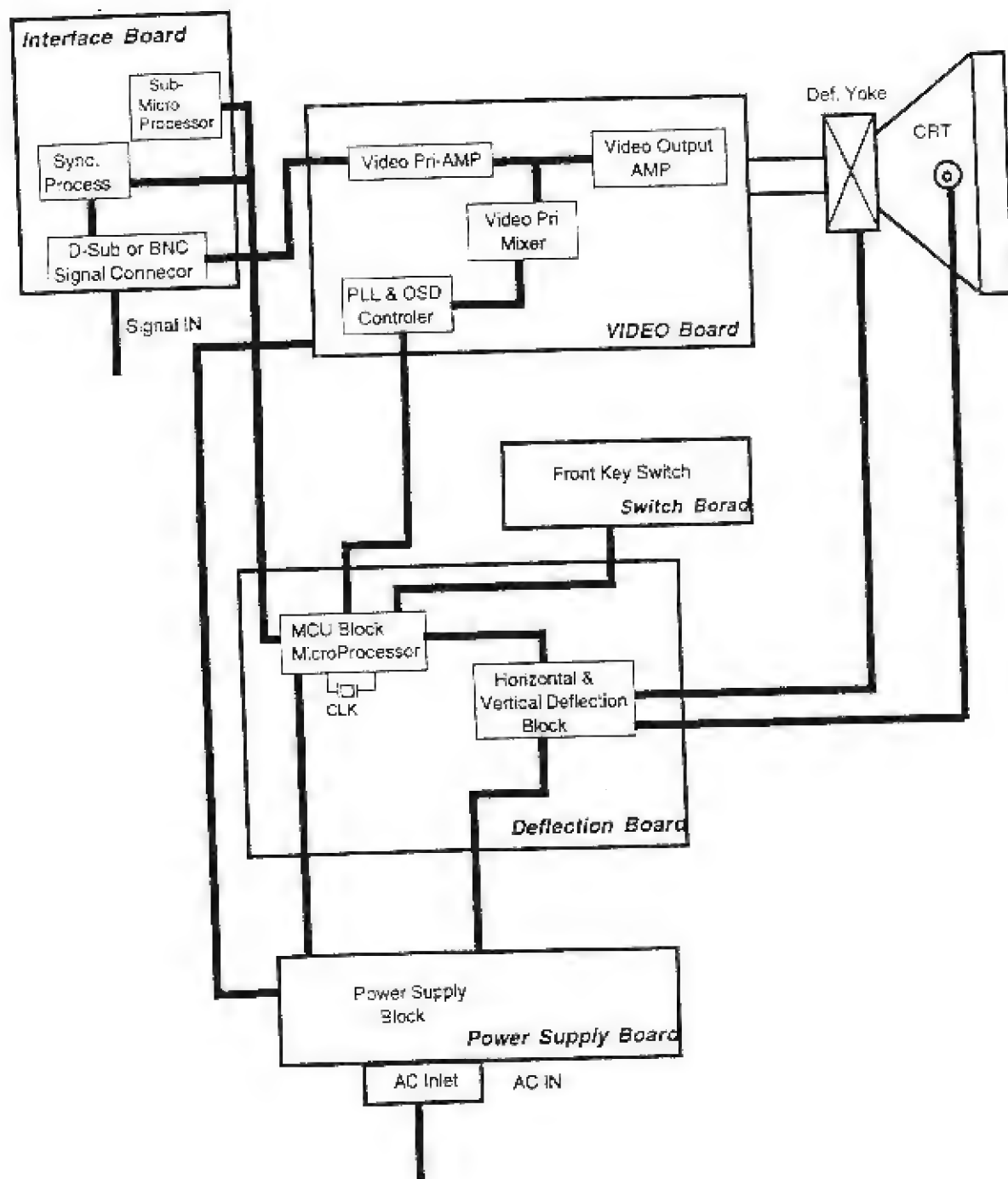


CHART DETAIL

- A: TOTAL(LINE or DOTS)
- B: Front porch
- C: Sync pulse width
- D: Back porch
- E: Blanking time
- F: Active(LINE or DOTS)

SECTION 3 : BLOCK DIAGRAMS



SECTION 4 : CIRCUIT DESCRIPTIONS

4.1 Deflection Board (D Board) Operations

Deflection Board consists of horizontal drive and output, Cs (S-Cap) Selection, +B (DC-DC Converter), high voltage output, vertical output circuit and focus bias circuit.

4.1.1 Horizontal and Vertical Drive Control

Horizontal & Vertical oscillation is controlled by IC613(μ PC1883) on MCU Board (M Board). The horizontal control section consists of Sync polarity detection, Phase shifter, H-width, H-OSC, APC, F/V control and horizontal duty control. The vertical section consists of Sync polarity detection, V-OSC, V-Ramp generator, the V-sweep correction of a vertical linearity, and E-W distortion, such as side-pin, trapezoid, pin-balance, parallelogram.

The horizontal drive pulse comes from pin 18 of IC610 and applied to pin 14 of P201 on D-Board as HDP. And this pulse is applied to gate of Q304 of H-Drive FET and amplified to output stage through the horizontal drive transformer T301. Horizontal output transistor Q356 operates simply as a switch and this switching operation generates a saw-tooth current through the H-deflection coil.

The vertical drive ramp wave pulse comes from pin 9 of IC610 and applied to pin 17 of P202 on D-Board as VS-OUT. And this pulse is applied to pin 5 of IC201. IC201 is a monolithic integrated circuit. It is a full performance and very efficient vertical deflection which intended for direct drive of vertical deflection coil, and pin 2 of this IC generates output saw-tooth current through the V-deflection coil.

4.1.2 High Voltage Output and Focus Bias

The high voltage power supply +B1 (+160V) applies to pin 6 of FBT, then applied to source of Q402 (HV-Output FET). The gate of Q402 is controlled by PWM pulse which generated by PWM Board, and regulate the high voltage.

Focus correction is applicable to both of Horizontal and Vertical. The horizontal one consists of Q452/Q453 and Q451, and the control parabolic wave form is applied from pin 13 of P202 on MCU. The vertical one consists of Q450, and the control parabolic wave form is applied from pin 14 of P202 on MCU. And the mixed parabolic wave of horizontal and vertical is applied to FBT.

4.1.3 Cs (S-Cap. Change) circuit

To optimize horizontal linearity, MCU controls horizontal S-Wave form correction capacitor (Cs). Q305 through Q308 (MOS FETs) are Cs change. MCU decides appropriate capacitor and output Cs select signal.

4.1.4 +B Converter (Chopper) circuit

Horizontal size adjusting is controlled by +B Chopper circuit consist of Q350 and T350 etc. This control voltage is generated by H-control section on MCU Board. Modulated voltage is applied to gate of Q350 (Chopper FET), and +B (DC voltage) is chopped and applied to primary winding of T350, then applied to Q356 (H-Output Transistor).

4.1.5 AEF Reduction circuit

AEF Reduction circuit consists of T451 and its surrounding devices. This circuit is used for alternate electric field emission from CRT face. This is a TCO's countermeasure circuit.

4.2 Video Board (V Board) Operations

Video Board (V Board) consists of video output, video clamp, screen voltage control, horizontal static convergence control, and CRT electrode circuit.

4.2.1 Video output, clamp and OSD circuit

Each video signal R,G,B from Interface board (I board) are

applied to preamp of IC801. OSD signal is mixed to each video output which are coming from IC801 (M52320SP), then these mixed video signals are applied to Output amp of IC805 (VP553) and amplified 15 times (about 23 dB). Amplified signals (output of pin 4, 8, 14 of IC805) are cut DC by capacitor of C833, 835, 837 applied to R,G,B CRT electrode. The bias level (Background level) of video signals are adjusted by the diode clamp circuit consist of D811 through D813 and Q811 through Q816. This circuit adjust the white balance of back raster level.

The OSD control circuit consists of IC802 (M35045) as a OSD control chip. PLL chip is mounted on I board. These two chips are controlled by the serial data from MCU. The IC802 consists of OSD video memory and its control circuit.

4.2.2 D/A converter

The MCU controls video bias level (back ground level), video drive level, and contrast. The D/A control signals are sent from the MCU by the 3 signals (clock data load), and controlled signals are output to the each circuit. Video bias control signals are amplified by the IC802 and applied to the bias drive circuit on the Video board. The D/A control data is periodically refreshed.

4.2.3 Screen voltage control circuit

The screen voltage (V_g) of CRT electrode is generated by pin 10 of FBT and applied directly as a constant value.

4.3 Interface Board (I Board) Operations

Interface Board (I Board) consists of video input selector, video preamp, sync-processor, D/A converter, OSD controller and sub-micro computer.

4.3.1 Video input selector circuit

This monitor has two inputs, D-type subminiature connector and BNC type connector. These inputs are selected by IC101 (M52348SP). Input selection signal is controlled by MCU.

4.3.2 Sync Processing circuit

Input separate sync signals or composite sync signal or green sync signals are shaped by the sync precessing circuit, consist of IC102 etc. Separated or shaped signals (HD and VD) are applied to the MCU board and clamp pulse generating circuit.

4.3.3 OSD PLL controller

OSD PLL controller circuit consist of IC103 (HC221AP). The IC103 generates OSD serial clock synchronous to the horizontal and vertical sync-signal.

4.4 Switching Power Supply (SR Board) Operations

4.4.1 Switching circuit

This Switching Power Supply (SR Board) consists of EMI filter circuit, AC rectifier and primary control, secondary rectifier, and power saving control circuit.

AC input from P901 is rectified by D901 through the EMI filter and smoothed by C907. Inrush current is protected by the R902 (Fusing resistor) and R903 which are shorted by the relay of K901 about 2 seconds after power on. IC902 is main switching controller integrated circuit. Pin 2 and Pin 3 of T903 are switching driver windings that control the switching frequency and its pulse duty. T902 is countermeasure device for high harmonic current.

Pin 18, 17, 12 and 10, are the secondary output taps, each voltages are shown as follows.

Pin No.	Output voltages	Remarks
10	-15V	MCU Board control circuit
12	15V	MCU, Video preamp, D board control
17	75V	Video output, H Def drive
18	160V	Horizontal output, HV output

IC901 is sub-power supply control IC. This power is only applied to a secondary of micro computer circuit (MCU) through separate transformer T901. Each output voltages are shown as follows.

Pin No.	Output voltages	Remarks
10 of T901	7V PS, MCU Board control circuit	
3 of IC951	6.3V H1 (Heater voltage)	

+B line is sensed by the IC952 (error amp) and this device drives photo coupler PH901. If output voltage of +B line is increased, this delta voltage is increasing and switching ON duty becomes small so that each secondary output voltage is controlled to be low.

4.4.2 Power saving circuit

The Power saving signals which are sent from the MCU, control the three mode of standby, suspend (less 15W), off (less 8w) and shutdown. Previous 2 modes are return automatically, but shutdown mode doesn't recover, which recovers only power SW operation.

The difference between suspend mode and off mode is a heater voltage active or not, the first one is active but the second is non-active. Therefore the recovery time of power off mode is equal to the normal powering on time.

-Suspend mode-

When the PS-CTL1 signal is active (low active), then the Q952 is off, and primary photo-coupler PH902 becomes off, then Q902 is on state, and the emitter current of Q902 applies to pin 8 of IC902. Since pin 8 is trigger sensing point for the oscillation stop of IC902, all main switching power supply which generates through T902 become off state. After all, when PS-CTL1 is active, monitor becomes suspend mode.

-Off mode-

When both of PS-CTL1 & PS-CTL2 are active (low active), pin 2 of IC951 is low, then heater voltage which generates from IC951 becomes off. So that, off mode is only supply for +7V which is used for MCU control circuit.

Standby mode is achieved by D-Board and MCU Board to decrease the horizontal size.

4.4.3 Protection circuit

-Shuts down mode-

This monitor provides some protectors when abnormal has happened. When internal circuit has broken and/or damaged, this monitor shuts down immediately and power indicator LED becomes Red. The sensing of shuts down are OCP (Over Current Protection), OVP (Over Voltage Protection), HV-PRO (High Voltage Protection) and Beam PRO (Beam Current Protection). When becoming this mode, all of PS-CTL1, 2, 3 are active.

-CAUTION-

F901 and F902 are AC line fuse of this monitor. If blew, replace only same type and rating as follows.

Type:	215
Rating:	T5AH 250V
Mfr.:	Littell inc.

4.5 MCU Board (M Board) Operations

MCU (Micro Computer Unit) board controls all the monitor's operation state, that are horizontal frequency, picture adjustment, white balance control, OSD control and MCU protection.

MCU consists of MCU block circuit (MCU chip, clock, EEPROM, D/A converter and their communication ports), horizontal and vertical oscillation block, horizontal distortion and size control circuit, HV control, screen Tilt control circuit and etc.

4.5.1 MCU block circuit

The MCU is 16 Bit microcontroller which has 32kB of ROM and 1kB of RAM and operates 20MHz clock speed. IC604 (MB3773) is a reset generator which generates a reset signal when power on and the MCU runs away. IC605 (HC574) is a EEPROM which has 8k Bytes (64k bits) capacity. This chip contains adjustment data, MCU operation data and OSD data. IC606 (S-2864A) is a data latch. IC607 and IC608 (M62352) are D/A converter -Digital to Analogue which bit width is 8 bits of adjust screen rates.

By the input of H-sync and V-sync from I Board, the MCU detects the input signal timing mode and outputs the stored data in EEPROM to the D/A converter and several control data (i.e. Cs, horizontal frequency control, OSD control etc.) to external ports or internal control section.

When the adjustment mode, the MCU control the picture screen data and store these data to EEPROM.

This MCU has a external serial communication port which based on RS-232C (but signal level is 0 to 5V). Using this port, MCU communicates external host computer and controls several functions. The port is used for automatic picture screen adjustments and the other service adjustments.

4.5.2 Horizontal size and Distortion control circuit

The circuit around IC612 are horizontal size & distortion control circuit. This circuit generates PWM pulse which synchronized horizontal frequency, and this controls +B chopper circuit which are shown in item 4.1.4. Final this control PWM pulse generates from Q628 and applied to Q350 Chopper FET of D-Board.

This monitor provides several distortion adjust functions, such as pincushion, trapezoid, parallel, bow and Sine (Hourglass) & Cosine (Hooking). These original correction wave forms are generates from pin 10 of IC610 as a E/W parabolic wave which is shown in item 4.1.1., and this parabolic wave is applied & mixed to IC612, then controls the gate of Q350 with H-Size modulated pulse and adjust the each distortions.

4.5.3 H and V Focus control circuit

The circuit around, IC615, IC617 are horizontal and vertical focus control section. The horizontal one uses AFC and H-DF signals, and this original rectangular pulse are integrated two times, then generates parabolic wave and this wave applied to Horizontal Dynamic focus amp on D-Board. The vertical one uses VFV and V-Size signal, and generates V-rate parabolic wave by same method of horizontal ones, then applied to Vertical Dynamic focus amp on D-Board.

4.5.4 High voltage control circuit -PWM Board

The actual anode voltage(HV) sensed by the resistors divided voltage in the FBT breeder and R410 & RV401 on the D Board, and this voltage is applied to pin 11 of P603 on MCU Board. This voltage is buffered by the IC751 and applied to IC752 on PWM Board as a HV control circuit.

The circuit around IC751 and 752 are the PWM control circuit, that convert the HV control voltage to pulse width synchronized horizontal frequency. Here Q752 and Q753 are buffer stage of the PWM circuit and this pulse applied to Q350 - Chopper switching MOSFET -on the D Board.

4.5.5 Vertical Static convergence control circuit

The ramp wave synchronized vertical deflection is generated by pin 3,4 of IC616 (analogue switch), and this wave is split off the part of positive and negative. The positive part of this wave is attenuated by the pot. of RC643, also negative part is attenuated by the pot. RC644. These pots are control the misconvergence of top part (RC644:BOTTOM) and bottom part (RC644:TOP) of the screen. The signal named VSTAT is vertical static convergence control signal and applied to IC 622. Buffered by Q656 and Q657, vertical convergence control signal drives the Vertical Convergence Coil mounted on the Deflection Yoke.

4.5.6 Horizontal Static convergence control circuit

The circuit around IC621 and Q654,655 is horizontal convergence circuit. The voltage from D/A converter is applied to IC621, and buffered by Q654, Q655, and the horizontal convergence control signal drives the Horizontal Convergence Coil mounted on the Deflection Yoke.

4.5.7 Rotation control circuit

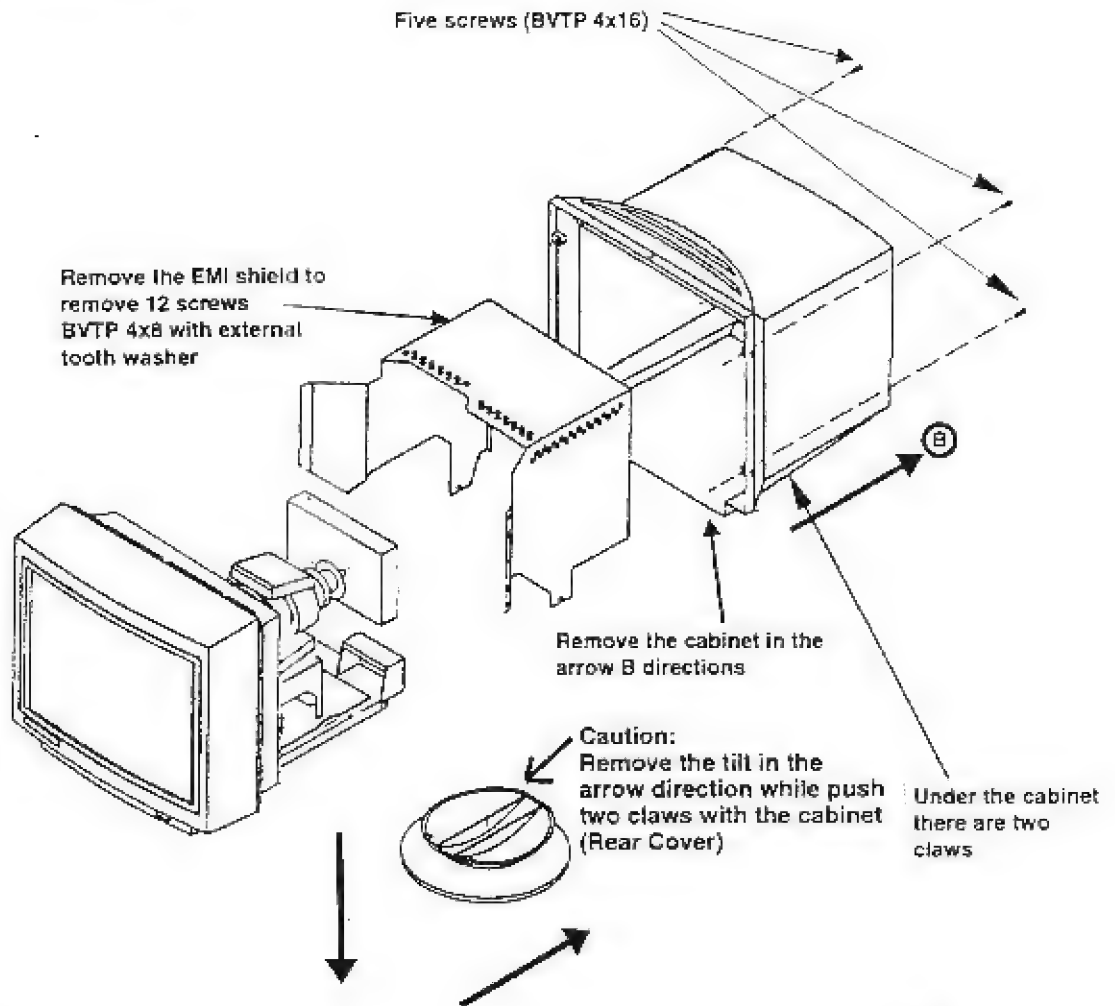
The circuit around IC621 and Q652,653 is the rotation (Tilt) control circuit. The voltage from D/A converter is applied to IC621, and buffered by Q652, Q653, rotation control signal drives the rotation coil mounted on the CRT.

4.5.8 Protector control circuit

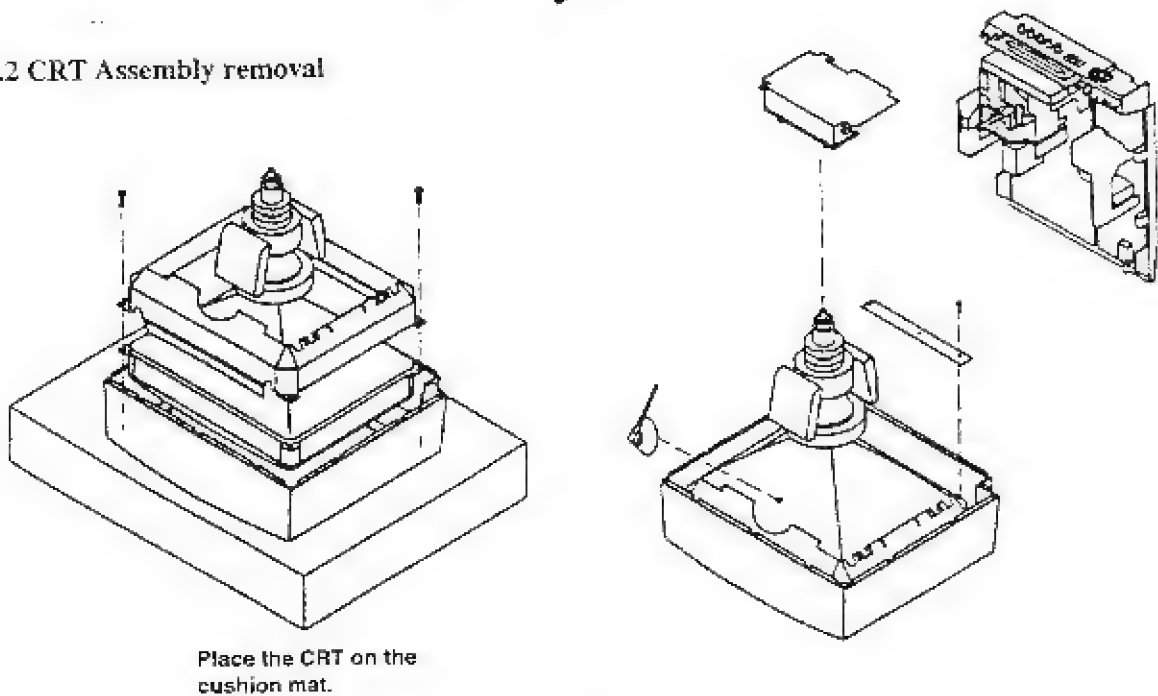
The circuit around Q640, 642 is the protector control circuit. The each protector trigger signals generates MCU chip and these drives power save and protector circuit on SR (Power Supply) Board.

SECTION 5: DISASSEMBLY

5.1 Tilt and cabinet removal



5.2 CRT Assembly removal



SECTION 6 SERVICE SOFTWARE

6.1 Operating environment

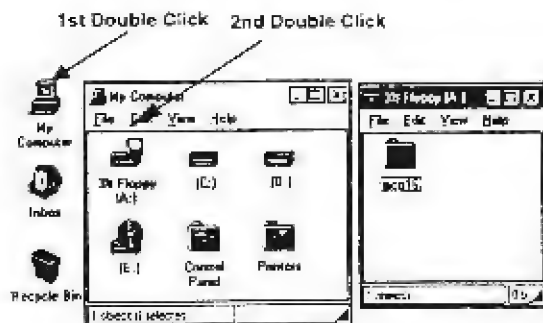
To operate this servicing software, following environment is needed.

- *IBM-PC or compatible machines.
- *Windows®95 or later.
- *RS-232C (CH1, or CH2).
- *Communication unit (Monitor to Host PC).
- *Signal generator (With clock of at least 135MHz).
- *MCP16 (Monitor Control Program 16) version 1.10 or later.
- *Power supply +2.5V~6V
- *Digital VOLT METER.

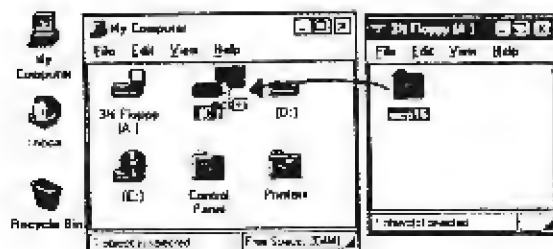
6.2 installation

Caution: Before install the program, please make back-up copy of the diskette. All installation instructions assume that you are working with back-up copy of the diskette.

- When operation Windows environment, insert the MCP16 diskette in the A drive.
- Open the MyComputer icon and the 3.5Floppy icon



- Drag the folder named MCP16 onto the Harddisk drive to copy the files.



- Insert the next diskette and copy the file as was mentioned above.
- After finished the copying, Click the icon named MCP16

*When the correct password is not input, the MCP16 has only minimum level of menu.
You will have this password from the authorized dealer.*

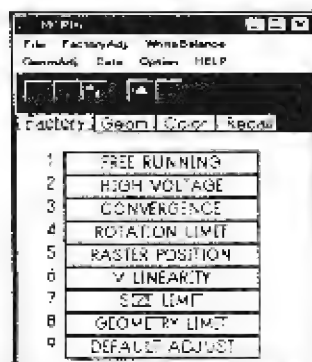
6.3 Operations

6.3.1 SQC menu

The SQC (sequence) menu operates sequential adjustment of the monitor. This command calls the adjustment items sequentially and should be used when the whole adjustment of the monitor are needed. (i.e. MCU board is changed. Most of the monitor adjustment data are stored on the EPROM of the MCU board.)

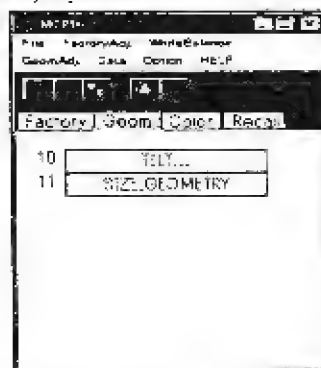
6.3.2 Factory Adjustment screen

This menu includes the items which can not adjust by front panel. This menu should be used when factory preset timings have changed, or FBT, MCU board changed.



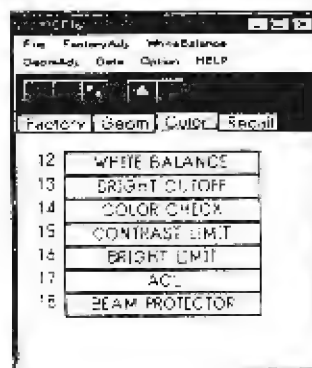
6.3.4 Geometry Adj menu

This menu consists of general adjustment which can adjust by front panel. This menu can adjust factory preset CH, but front panel can only adjust user CH.



6.3.3 Color screen

This menu includes the white balance and luminance adjustment items. When the CRT or CRT board is changed, then readjust the white balance and luminance by this commands.



6.3.5 DATA menu

This menu has only Last Protect command. This command uses when the MCU protection has operated. About MCU protection, please refer to section 7.1 (Appendix)



Fig 6.3.6 Data menu

6.3.6 Option menu

This menu are the utilities of this program. The Test Pattern command displays the test pattern which is selected by check-box. This command is convenient when the monitor adjustment is operated by the Host machine signal.

The Password command changes the menu of MCP16 when the correct password is input.

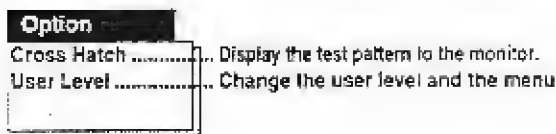


Fig 6.3.7 Option menu

6.3.7 Help

This command displays the usage help of each command.



*1 Help File is needed

Fig 6.3.8 Help menu

EEPROM	Contentment
ADDRESS	
0000H ~ 0160H	Fundamental monitor operating data area (user can not access)
0180H ~ 01BFH	White balance and color data area. (white balance, user color) only user color can access.
01C0H ~ 0200H	Common adjustment data area and back up area. (Rotation, convergence, brightness, contrast, etc.)
0280H ~ 06A0H	Independent CH adjustment data area. (Signal name, size, position, distortion, H/V ch frequency data) user can access area.
0BC0H ~ 1FFFH	OSD data area

- User access area
- - - - - Partially user access area
- Can not access area

Fig 6.4.1 EEPROM data location map

6.4 Others

6.4.1 Monitor Reset

If the adjustment has been made, it is necessary to confirm the adjustment. To confirm the adjustment, the monitor reset should be done. There are two ways to reset the monitor, one way is power switch on again, other way is using the RESET command on the File menu. The RESET command is attached the command short cut button. Instead of opening the Data - RESET command, click the short cut button, then RESET command is operated. (please refer to section 6.7: Appendix)

6.4.2 Error

If the connector of communications unit is not connected properly, or the monitor power is not on, following error message is displayed.

There are no response from the monitor
Please check the connection, monitor power

6.4.3 EEPROM data location

The PT810-3 has 8kbyte of data memory on the MCU board. This service software accessed only adjustment element

6.4.4 Communications Unit

The communications unit for service connects an IBM PC or compatibles and the PT810-3. The computer side is a D-sub 25-pin male connector.

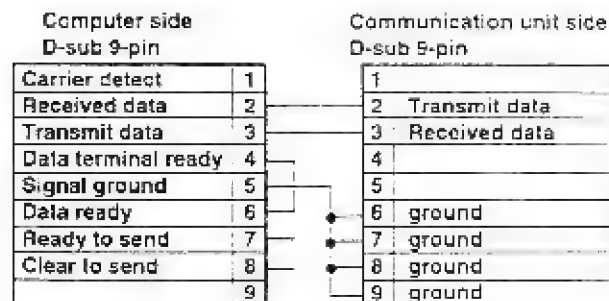


Fig 6.4.2 Communication unit connection diagram (9-pin)

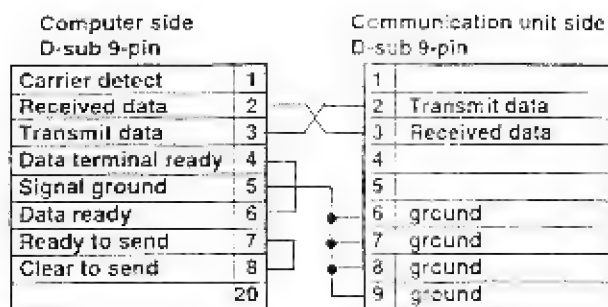


Fig 6.4.3 Communication unit connection diagram (25-pin)

Depending on the computer connected, the RS-232C connector is either a D-sub 25-pin female connector or D-sub 9-pin female connector. Fig 6.4.2 and 6.4.3 show the pin layout for each connector. Please use the connector appropriate to your computer.

6.4.5 Communication Unit connection

How to connect the communication Unit
(Monitor side)

Remove the cover of communication connector of the monitor which is located rear panel, and connect the 8-pin mini-DIN connector.

(Computer side)

Connect the 9-P or 25-P D-sub connector to the RS-232C port (if the port exists more than two, then connect RS232C-1 port.)

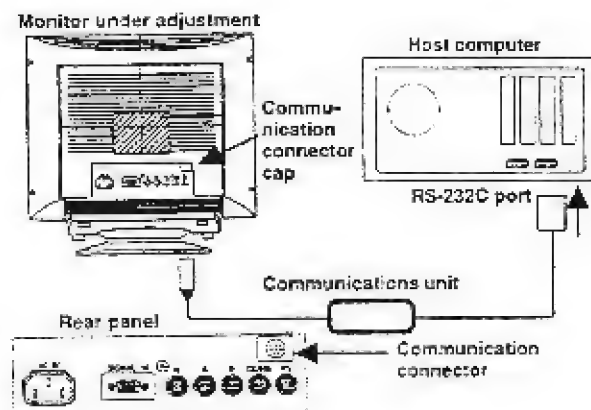


Fig 6.4.4 Communication unit connection

6.5 Safety Related Adjustment

When replacing the following components, you must make this adjustment and confirmation.

FBT (PCF71-04-T401)	(all adjustment is needed)
MCU Board	(HV,HD,BL adjustment is needed)
R410,R409	(BL adjustment is needed)

Where HV is High Voltage, HD is HOLD-DOWN, BL is Beam Limiter.

All adjustment and confirmation should be done under following condition.

1280x1024 75Hz mode
No video (No screen image)

6.5.1 HV Regulator circuit adjustment and confirmation

When replacing the FBT, confirm from first step (from a. to j.).
When replacing the MCU board, confirm from step f to j.).

- Remove the sealing cap and the RV401 of the D board.
 - Resoldering the new parts of the RV401.
 - Receive specified signal.
 - Set the BRIGHTNESS and CONTRAST controls to minimum condition. (Cut-Off condition).
 - Connect the digital multimeter to pin 7 of P603 (HVS-OUT) on the MCU board.
 - Adjust this voltage for $2.50 \pm 0.01V$ DC by using the MCP16-service software (High Voltage menu), and after finished, click OK.
- When displayed <HV Protect Point() >, then click OK.
- After power off, connect the High Voltage meter to the CRT anode, then power on again.
 - Adjust the High Voltage for $27.0KV \pm 0.1KV$ by the RV401, and after finished this adjustment, seal the RV401 by the specified sealing cap and silicone.
 - Repeat from step f and h.
 - After RESET the monitor, confirm the voltage is set upper value.

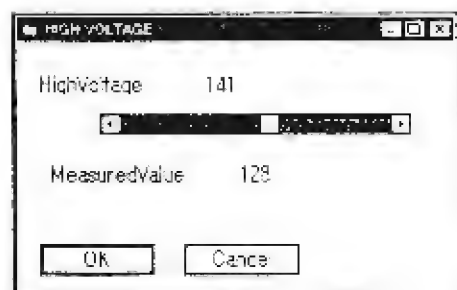


Fig 6.5.1 High Voltage Adjustment menu

6.5.2 HV HOLD-DOWN Circuit confirmation

- Receive the specified signal.
- Set the **BRIGHTNESS** and **CONTRAST** controls to minimum condition. (Cut-Off condition)
- Apply an external DC voltage gradually to pin 11 of P603 (HV-sense) on the MCU board, and confirm that the minimum voltage is less than 2.76V DC where by the HOLD-DOWN circuit operates immediately and raster disappears. And also when apply 2.57VDC, then confirm that HOLD-DOWN circuit does not operate

6.5.3 BEAM PROTECTOR Adjustment and confirmation

When replacing the MCU board or the components of R410 or R409 ,Beam Protector adjustment is needed.

- Receive the specified signal.
 - Open the Beam Protector menu of MCP16 (Beam Protector), and apply an external DC voltage -4.75V DC to pin 8 of P603 (ACL) on the MCU board.
- If the voltage is set, then click **COPY** Button and **OK** Button.

Note: Do not click "OK", when no apply specified voltage to pin 8 of P603.

- RESET the menu
- Apply an external DC voltage gradually to pin 8 of P603 (ACL) on the MCU board, and confirm that the minimum voltage is less than -5.0V DC where by the Beam Limiter circuit operates immediately and raster disappears.

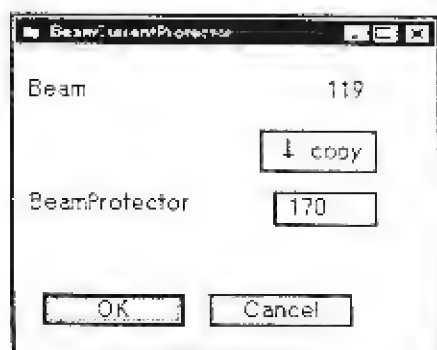


Fig 6.5.2 Beam Limit Adjustment menu

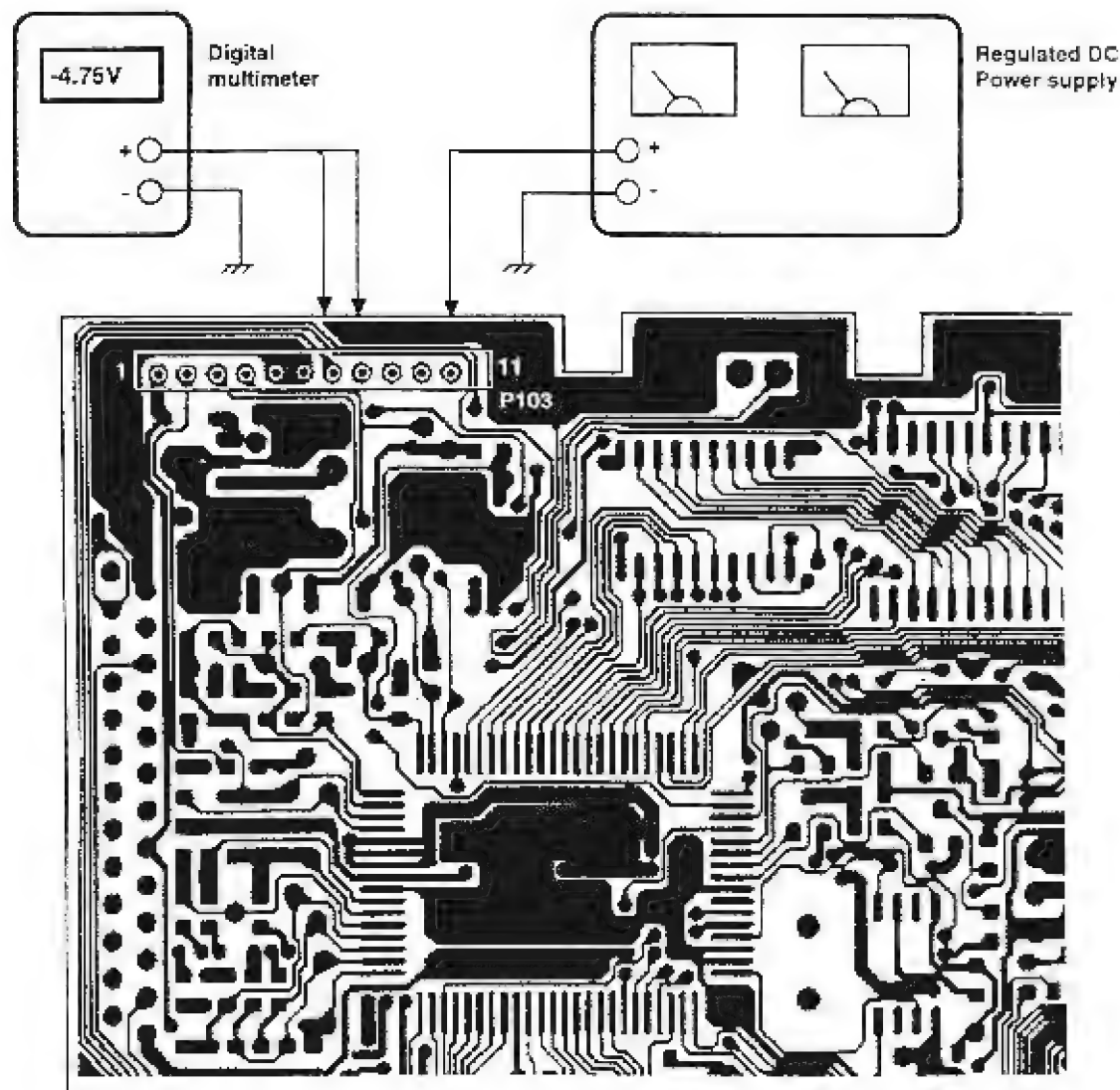


Fig 6.5.3 HOLD DOWN and BEAM LIMITER check point

6.6 Adjustment Procedure

6.6.1 Necessary adjustment for several change

If units or components on the unit has changed, following adjustments are needed.

Adjustment Item	Changed components or bloc						Comments
	PWM Board	D Board	V Board	PS Board	I Board	MCU Board	
(1) Fh adjustment						X	
(2) High voltage	X	X ^{*1}				X	X ^{*1}
(3) Rotation (Tilt)						X	X
(4) Convergence	X	X ^{*1,2}	X [*]			X	X
(5) Raster Position		X				X	X
(6) H-Size Limit	X	X				X	
(7) V Linearity		X				X	X ^{*1}
(8) Distortion Limit	X	X				X	X ^{*1}
(9) V-Size Limit		X				X	X ^{*1}
(10) Size, Position and Distortion	X	X		X [*]		X	X
(11) White balance			X [*]		X [*]	X [*]	X
(12) Brightness cut off point			X [*]		X [*]	X [*]	X
(13) Contrast			X [*]		X [*]	X [*]	X
(14) Bright Limit			X [*]		X [*]	X [*]	X
(15) ACL			X [*]		X [*]	X	X
(16) Colour data							
(17) Beam Limit		X [*]	X		X [*]	X	
(20) Focus	X	X [*]					X
Safety Related adjustment		X []				X	X

X means that adjustment is needed.

*1 Only confirmation is needed, but readjust if adjustment is out of range.

*2 When changed MCU board, if old data of MCU can readable and transfer this data to new MCU, only confirmation should be needed, but readjust if adjustment is out of range. (white balance data are transmitted to I board as digital data.)

*3 If changed FBTL, this adjustments are needed.

6.6.3 Adjustment items

Adjustment should be done by following procedure.

6.6.2 Adjustment Order

The order of adjustment is very important for adjustment. The order of adjustment is considered to make best adjustment.

This menu accesses sequentially the item of adjustment.

Adjustment order should be done by screen menu's order on MCP16. When change the adjustment order, make sure about the other adjustment items.

(1) Fh Adjustment (Horizontal Free running frequency)

(Adjustment condition)

31.5kHz, 95kHz, 60kHz Timing

- Input the 31.5kHz timing, and select <HFree running Low>. When select this point, the screen horizontal synchronizator has on, then adjust the screen is almost standstill by right or left arrow key.
- Input the 95kHz timing, and select <HFree running High>. then adjust the screen is almost standstill by right or left arrow key.

c. After finished above a. to c. adjustment, click the <OK> button, the horizontal synchronization data is stored to EEPROM immediately and the screen becomes normal condition.

***Caution:** When making this adjustment, horizontal synchronization is out, so it should be needed another monitor to make this adjustment.

(4) Rotation (Tilt) adjustment

(Adjustment condition)

fh 80kHz

Cross Hatch pattern

- Adjust the upper and lower line of screen image to have parallel with bezel frame line by <Rotation> cursor.
- After finished this adjustment, click <OK>, then the data of Rotation limit is stored to EEPROM immediately.



Fig 6.6.1 Fh Adjustment menu

(2) High Voltage adjustment

Please refer to Safety Related adjustment on section 5.5

(3) Convergence adjustment

(Adjustment condition)

fh 80kHz

Cross Hatch pattern

Non reverse (black background) Green

video off

- Adjust the all Red and Blue vertical line to almost overlap each other in all of the screen by <H Conver> cursor.
- Adjust the all Red and Blue horizontal line to almost overlap each other in all of the screen by <V Conver> cursor. After finished above a. to b., then click <OK> button.

When click <OK> button, the convergence data is stored immediately to user area.

* To make further adjustment, please refer to appendix 1 -- Mis convergence correction -- on page 26

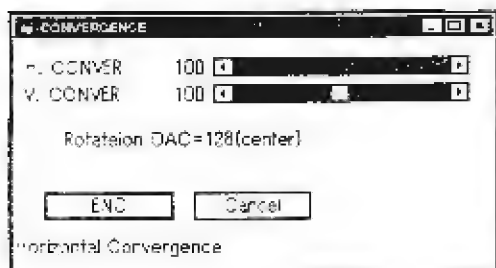


Fig 6.6.2 Convergence Adjustment menu

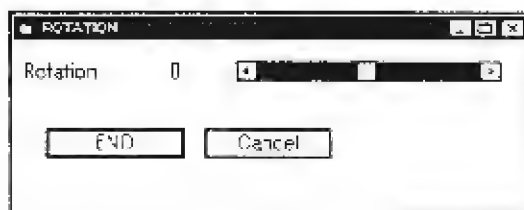


Fig 6.5.3 Rotation limit adjustment menu

(5) Raster Position

(Adjustment condition)

VGA 480L (Low),

fh 96kHz / fv 160Hz) (High)

Cross Hatch pattern

- Input the VGA 480 line signal timing, then adjust the raster for the center position of the screen by <Low HF> cursor.
- Input the 96kHz / 160Hz mode, then adjust the raster for the center position of the screen by <High HF> cursor.

*Note 1 When having <RESET>, horizontal raster position may shift right, than pre-adjusted position.

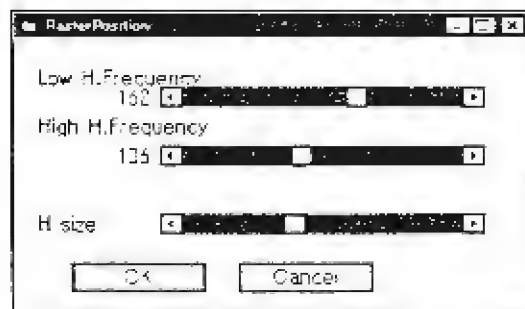


Fig 6.6.4 Raster Position Adjustment menu

(6) Vertical Linearity adjustment
(Adjustment condition)
VGA480L timing (Low)
and 95kHz / 160Hz timing (High)
Cross Hatch pattern

**This adjustment requires only vertical VGA480L and 95kHz / 160Hz timings. Horizontal timing is not specified (Horizontal timing is not concerned for this adjustment.)*

- Input the vertical frequency VGA480L timing, then adjust the upper half and lower half of screen for becoming to same size by <Fv=160Hz> cursor.
- Input the vertical frequency 120Hz timing, then adjust the upper half and lower half of screen for becoming to same size by <Fv=120Hz> cursor. (similar to step a.)
- After finished above a. to b. step, click <OK> button. When click <OK> button, the vertical linearity data is stored immediately to factory data area.

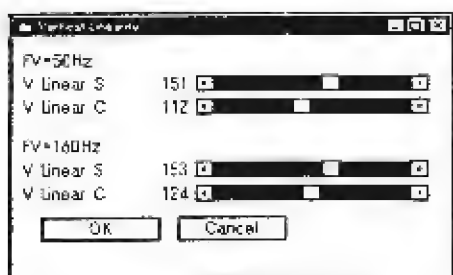


Fig 6.6.5 V Linearity Adjustment menu

(7) Size Limit adjustment

Horizontal Size Limit adjustment
(Adjustment condition)
95kHz/160Hz, MAC 480L
Cross Hatch pattern

- Input the MAC 480 Line timing, then adjust the horizontal size for almost bezel frame line by <H SIZE MAX 0> cursor.
- Input the 95kHz/160Hz timing, then adjust the horizontal size for 355mm by <H SIZE MIN> cursor.

V-size Limit adjustment
(Adjustment condition)
VGA400L
and 95kHz/160Hz timing
Cross Hatch pattern

**V-size min adjustment requires only vertical 160Hz timings. Horizontal timing is not specified (Horizontal timing is not concerned for this adjustment.)*

- Input the VGA 400 Line timing, then adjust the vertical size for almost over +10mm on bezel frame line by <V SIZE MAX 1> cursor.
- Input the 160Hz timing, then adjust the vertical size for 250mm by <V SIZE MIN> cursor.
- After finished above a. to c. adjustment , then click <OK>

button. When click <OK> button, the data of this adjustment is stored immediately to factory data area.

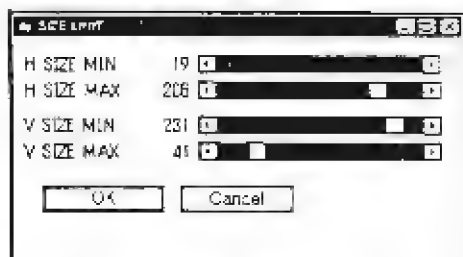


Fig 6.6.6 H Size Limit Adjustment menu

(8) Geometry Limit adjustment
(Adjustment condition)
80kHz timing (1280x1024 75Hz)
Cross Hatch pattern

- Adjust the **H-SIZE**, **H-POSITION**, **V-SIZE**, and **V-POSITION** by operational keys on the front panel (adjustment using OSD) for specified horizontal and vertical size and position.

<u>Horizontal size</u>	<u>380mm</u>
<u>Vertical size</u>	<u>285mm</u>
- After finished upper adjustment, then make best adjustment of the <PIN PHASE> - parallelogram adjustment, <PIN CUSHION>, <SIN>, and <COS> by each cursor.
- After finished above a. to b. adjustment, then click <OK> button. When click <OK> button, the data of this adjustment is stored immediately to factory data area.

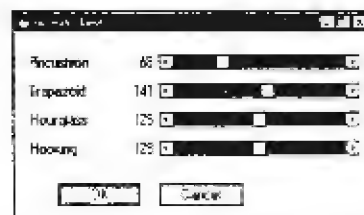


Fig 6.6.7 Geometry limit adjustment menu

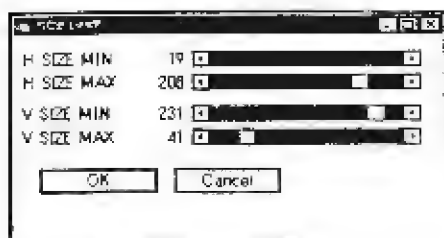


Fig 6.6.8 V Size Limit Adjustment menu

(10) Default adjustment

(Adjustment condition)

VGA 480L(Low) and

95K-160Hz timing (High)

Cross Hatch pattern

- Input the VGA480L timing and Select <Default adjust Low>. Adjust the horizontal size and position, vertical size and position, and distortions for specified value. (specified value -- please refer to specification section :page 4)
- After finished above adjustment, then click <OK>. When click <OK> button, the data of this adjustment are stored to specified data area.
- Input the 95KHz-160Hz timing, and adjust same above.

**This is adjustment for No Preset Timings.*

Before adjusting this item size limit and pin limit must be completed.

- Hour glass distortion adjustment corrects the right and left vertical line like a S curve.



- Hooking distortion adjustment corrects the right and left vertical line like a U curve. The difference between pincushion correction and U shape correction is the width of correction range. (Pincushion corrects from upper line to bottom line but cosine corrects around center of the screen.)



(11) Size , Position, and Distortion adjustment (Adjustment condition)

All preset timing

Cross Hatch pattern

- Input the specified timings described on section 2.2 (page 5), and adjust the horizontal size and position, vertical size and position, and distortions for specified value. (specified value -- please refer to specification section :page 4)
- After finished above adjustment, then click <OK>. When click <OK> button, the data of this adjustment are stored to specified ch data area (same as user adjustment area) If Back up box is checked, the adjustment data are transferred to back up area simultaneously.
- Change next preset timing and make same adjustment.

Before adjusting this item size limit and pin limit must be completed.

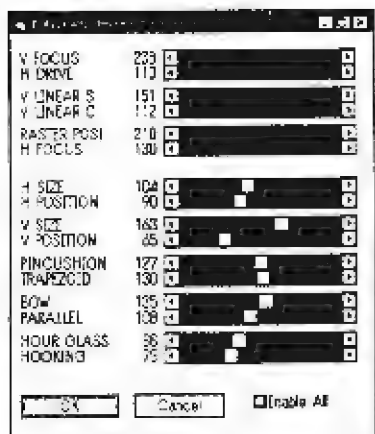
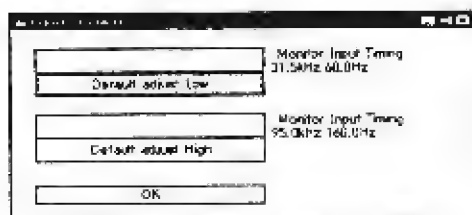


Fig 6.6.9 Default Size Position and Distortion Adjustment menu

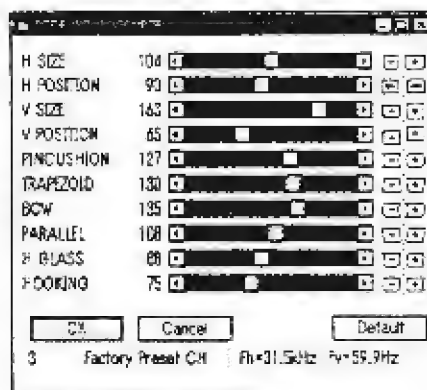
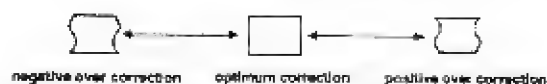


Fig 6.6.10 Default Size Position and Distortion Adjustment menu

Fig 6.6.9 Size Position and Distortion Adjustment menu

- * Hourglass distortion adjustment corrects the right and left vertical line like a S curve.



- * Hooking distortion adjustment corrects the right and left vertical line. The difference between pincushion correction and Hooking correction is the width of correction range.



(12) White balance

(Adjustment condition)

1280x1024 75Hz (80kHz) timing

No video (No screen image)

and 20% white window screen image.

- Adjust the back raster (back ground level) brightness and white balance to be following value under no video condition by <BIAS MAX R>, <BIAS MAX G> and <BIAS MAX B> cursor. The BIAS MAX data should be started with C8H, and VIDEO +B data should be started with 78H.

Back raster brightness: $4.5 \pm 0.3 \text{ cd/m}^2$
 White balance $X = 0.281 \pm 0.01$
 $Y = 0.311 \pm 0.01$

- Adjust the video brightness and white balance for following value under 20% window screen condition by <DRIVE R>, <DRIVE G>, <DRIVE B> and <CONTRAST> cursor.

Video brightness: $120 \pm 3 \text{ cd/m}^2$
 White balance $X = 0.283 \pm 0.01$
 $Y = 0.298 \pm 0.01$

In above adjustment, it should be fix the least colour data at **Y6H**.

- Adjust the video brightness and white balance to be following value under 20% white window screen image pattern by <BIAS MIN R>, <BIAS MIN G> and <BIAS MIN B> cursor. The BIAS MIN data should be started with 64H.

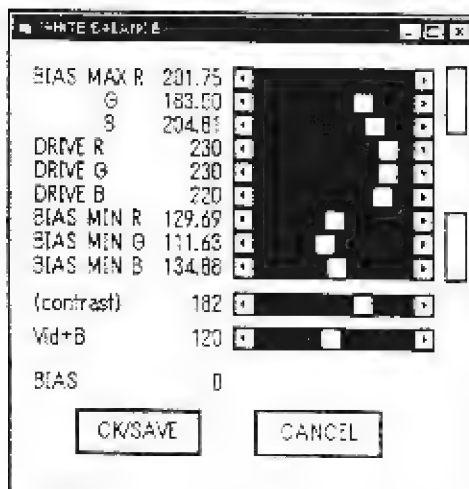


Fig 5.6.11 White balance Adjustment menu

Video brightness: $30 \pm 3 \text{ cd/m}^2$
 White balance: $X = 0.281 \pm 0.01$
 $Y = 0.311 \pm 0.01$

- d. After finished above a. to c. adjustment click <OK> button. When click <OK> button, the data of this adjustment are stored to factory colour adjustment data area. (This area can not access from the front control panel)

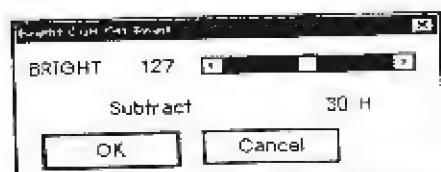


Fig 6.6.12 Brightness Cutoff Point Adjustment menu

(13) Brightness Cut off Point adjustment (Adjustment condition)

1280x1024 75Hz (79.97kHz) timing
 No video (No screen image)

- Adjust the back raster brightness level from 0.2 cd/m^2 to 0.25 cd/m^2 under no video condition by <Bright> cursor.
- After finished above adjustment, click <OK> button. When click <OK> button, the data of this adjustment is subtracted specified value and stored to factory data area.

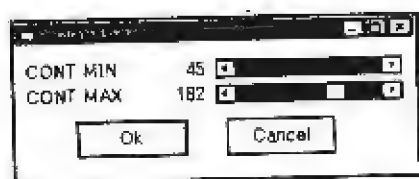


Fig 6.6.13 Contrast Adjustment menu

(14) Contrast adjustment

(Adjustment condition)

1280x1024 75Hz (79.97kHz) timing
 20% Window screen Image

- Adjust the maximum video contrast level for $120 \pm 2 \text{ cd/m}^2$ by <CONT MAX> cursor.
- Adjust the minimum video contrast level for $1 \pm 0.5 \text{ cd/m}^2$ by <CONT MIN> cursor.
- After finished above adjustment, click <OK> button. When click <OK> button, then the data of this adjustment is stored to factory data area.

**Before adjusting this item (Contrast), No.12 item (Brightness Cut Off Point) must be completed.*

(15) Bright Limit adjustment (Adjustment condition)

1280x1024 75Hz (80kHz) timing
 20% Window screen image

- Under 20% window screen, adjust the video brightness for $160 \pm 2 \text{ cd/m}^2$ by <ATTENUATION> cursor.
- After finished this adjustment, click <OK>. When click <OK> button, then the data of this adjustment is stored to factory data area.

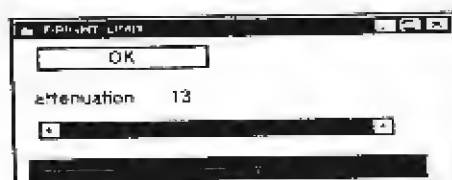


Fig 6.6.14 Brightness Limit Adjustment menu

(16) ACL (Automatic Contrast Limiter) adjustment (Adjustment condition)

1280x1024 75Hz (80kHz) timing
 All white screen image

- When select this menu, ACL level of the monitor is diminished and contrast and brightness are set to maximum level automatically.
- Adjust the ACL level for 90 cd/m^2 by <ACL> cursor.
- After finished this adjustment, click <OK> button. When click <OK> button, then the data is stored to factory data area.

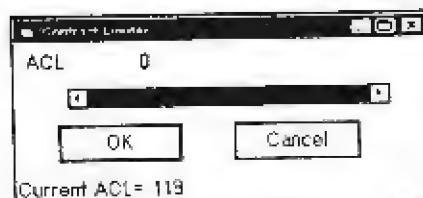


Fig 6.6.15 ACL Adjustment menu



Fig 6.6.16 Colour check menu

(17) Color confirmation

*The color data of No.2 and No.3 are set automatically to specified value when making adjustment of No.11 (White balance), then this adjustment is not needed on normal adjustment.

(condition)

1280x1024 75Hz (80kHz) timing
20% Window screen image

Color 1: All of <R>, <G>, and color data are FPH
Color 2: $X=0.313 \pm 0.01$, $Y=0.329 \pm 0.01$
Color 3: $X=0.323 \pm 0.01$, $Y=0.348 \pm 0.01$

(18) Beam Limit adjustment

Please refer to the safety related adjustment on section 6.5

(19) End

When quit this sequence menu, click the <OK> button.

(20) Focus

(Adjustment condition)

1280x1024 75Hz (80kHz) timing
Cross Hatch pattern or other specified special pattern
Contrast: MAX
Brightness: Just cut off

Adjust the screen focus to be fine in all area by using the two pots located on the FBT. (Upper located pot is for horizontal line adjustment, and other one is for vertical line adjustment)

When making this adjustment, Brightness and Contrast must be set above specified condition by front operational keys.

Displayed pattern should be better to use following pattern. (meme pattern). This pattern can display using option - closshatch command and check the box of focus pattern.

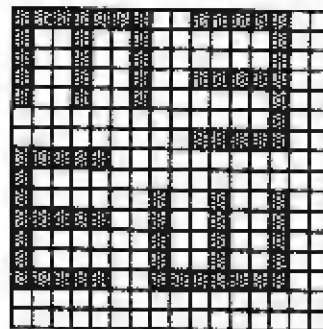


Fig 6.6.17 Focus adjustment pattern

At first using vertical line adjustment pot, adjust the vertical line focus and next using horizontal line adjustment pot, adjust the horizontal line focus.

For making good focus on entire screen, adjust the point specified Fig 6.6.8 best.

**It is not necessary to use Service software in this adjustment.*

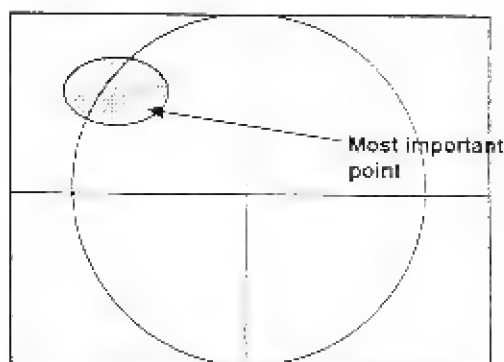
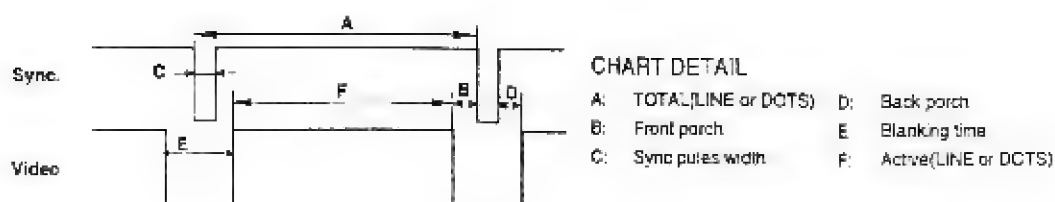


Fig 6.6.18 Most important point of focus adjustment

6.6.4 ViewSonic PT810 Service TIMING

Name	CH 1 80K	FH MIN 31.5K	FH MAX 95K	MAC480L	57K70Hz VESA70Hz	V-SIZE LIMIT				
Dot Clock (MHz)	135.0	25.175	164.10	30.24	75.00	25.175				
Horizontal										
H-Freq. (kHz)	79.97	31.47	94.97	35.00	56.47	31.47				
H-Total (Dots)	1688	800	1728	864	1328	800				
H-Front porch (Dots)	16	16		64	24	16				
H-Sync width (Dots)	144	96	164	64	136	96				
H-Back porch (Dots)	248	48	228	96	144	48				
H-blanking (Dots)	408			224	304					
H-Active (Dots)	1280	640	1280	640	1024	640				
Vertical										
Vertical Freq. (Hz)	75.03	59.94	159.88	66.67	70.06	70.09				
V-Total (Line)	1066	525	594	525	806	449				
V-Front porch (Line)	1	10		3	3	12				
V-Sync width (Line)	3	2	3	3	6	2				
V-Back porch (Line)	38	33	46	39	29	35				
V-Blanking (Line)	42	45		45	38					
V-Active (Line)	1024	480	525	480	768	400				
Sync.										
H-polarity/V-polarity	P/P	N/N	P/P	N/N	N/N	N/P				
Scanning mode										
Comment		VGA480				VGA400				

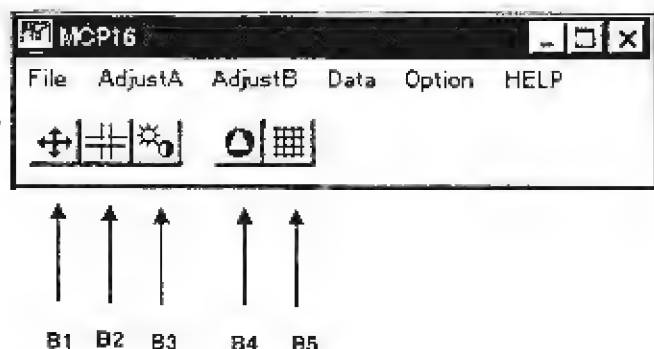


6.7 APPENDIX

6.7.1 MENU Short cut ICONs (Tool bar)

It is convenient to use Menu Short cut ICONs (Tool bar).

When you open the MCP16 software, the tool bar is displayed. If you push this ICON button, then specified Item appears without selection from menu line. Each button calls the following items.



B1 button Size Position Adjustment Item equivalent to User - Size, Distortion menu.

B2 button Convergence / Rotation Adjustment item equivalent to User - Convergence menu.

B3 button Bright/Contrast Adjustment item equivalent to User - Bright, Cont menu.

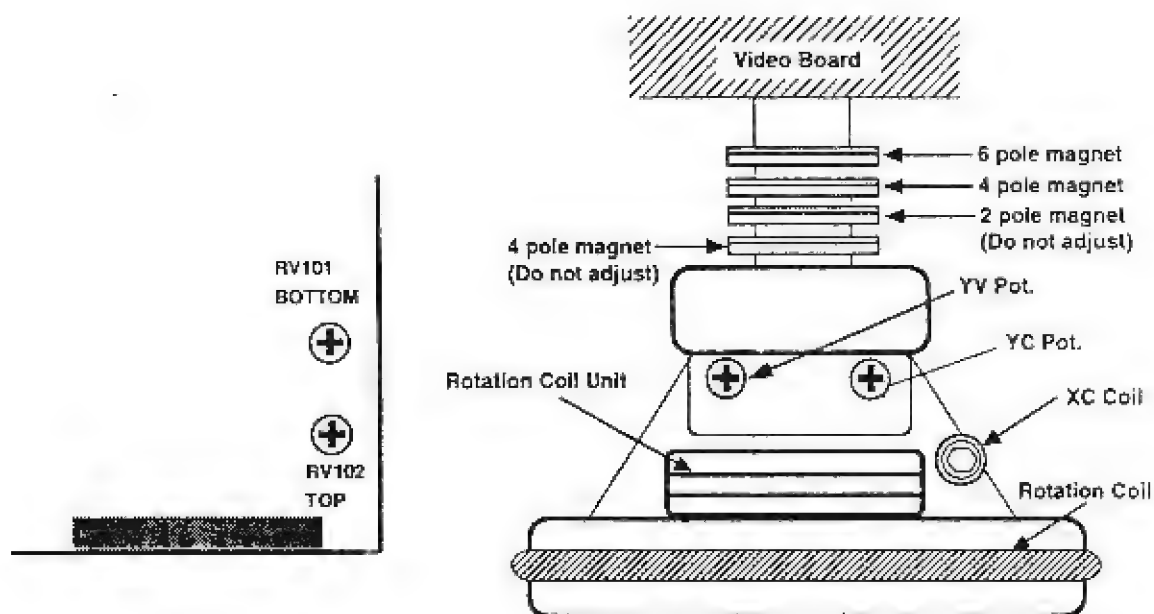
B4 button Reset item equivalent to Data - MCU Reset menu.

B5 button CROSS HATCH item equivalent to Option - CROSS Hatch menu.

6.7.4 MIS CONVERGENCE CORRECTION

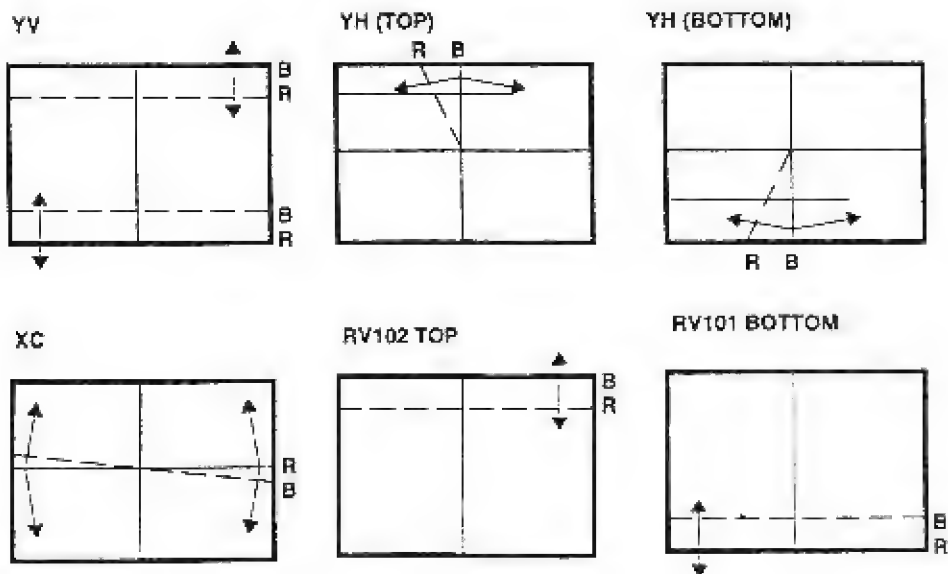
For adjust mis convergence exactly, it is needed to make adjustment around the deflection yoke.

Adjustment procedure is as follows.



6 pole magnet : R, B <-> G Convergence magnet
 4 pole magnet : R <-> B Convergence magnet
 2 pole magnet : purity adjustment magnet (For adjust purity (Landing), it needs magnetic chamber)

YV Pot. alignment should be adjusted with RV101 and RV102 on MCU Board to reduce the trapezoidal distortion.



SECTION 7 TROUBLE SHOOTING

7.1 Trouble Shoot

-- SYMPTOM --	-- CHECK --	--POSSIBLE CAUSE--	-- ACTION --
1. No image appears on the screen	1. Absence of HV charging sound.	1. 1 (When power supply is normal) a. Fail of horizontal deflection circuit	1. 1 a. Check horizontal deflection circuit components and replace if needed. (possible components) Q350 (horizontal chopper) Q356 (horizontal output) D357 (damper diode) Q304 (horizontal drive) *If Q356 has failed, it should be better to replace Q350 simultaneously.
		b. Fail of high voltage circuit	b. check high voltage circuit components and replace if needed. (possible components) Q402 (HV output)
		c. Fail of horizontal oscillation circuit. (M)	c. Check horizontal oscillation circuit on (M). IC104 (M) and around circuit.
2. Check of power indicator		1.2 (when power supply is abnormal) a. Lose of line connector. b. Lose of internal connector.	1.2 a. Check a connection. b. Check a connection of J901 through J904 and J951,952,953.
		c. Blow of fuse, F901,902 and fusing resistor R903	c. Replace fuse or fusing resistor. *caution when upper, case other parts may be broken.
		d. Failure of switching control component.	d. Replace IC901 (switching controller and primary switch.)
		(When power on, indicator LED light green about one second and a moment LED light red and power down.)	After searching the problem, change component if needed.
<div><p><i>In this case, MCU detect the failure of circuit and shutdown power supply.</i></p><p><i>This protector operates following case.</i></p><ul style="list-style-type: none">a. High voltage is over or under.b. +B1 voltage is over or under.c. +B1 current is over.d. Anode current is over.e. Horizontal size is too large or too small.<p><i>To confirm which case the protector operates, need the service software.</i></p><p><i>See appendix1 the end of this section.</i></p></div>			
2. Check of CRT electrodes			
Heater electrode	Failure of Heater electrode.	Replace CRT	
G2 electrode	a. G ₂ (Screen voltage drop.) b. Failure of MV rectifier circuit.	a: Check G2 control circuit. (V) b. Check 10pin of T401(FBT),R403 and D406	
R.G.B cathode electrode	c. Failure of video circuit	c. Check video circuit components and check the following connection especially. PB01 (video signal) PB02 (video control signal) PB04 (power supply of video)	

2. Poor Focus

3. Convergence

4. Dirt of colour

5. Low luminance

6. Poor white balance

7. Loss of colour

8. failure of horizontal synchronization

- a. Adjustment error.
- b. Failure of CRT (Can not improve focus.)
Reduction of beam emission.
- c. Failure of FBT (Can not improve focus.)
Failure of focus pot.
- d. Anode voltage drop.
Failure of high voltage circuit.

- a. Readjust focus by the pot. of FBT and using MCP16, adjust y-focus.
- b. Replace CRT.
- c. Replace FBT.
- d. Check High voltage control circuit, and replace (M).

Readjust convergence by the adjustment section.

Check of environment of monitor

- a. Magnetization of chases and CRT
- b. Abnormal environmental magnetic field.
- c. Failure of degaussing circuit.
- d. Short interval power ON-OFF
- e. CRT face direction change while power on.

- a. Degauss the monitor. (automatic or manual degaussing.)
- b. Apart the monitor from the abnormal place and degaussing.
- c. Check degaussing circuit.
TH901, Q951, P902
- d. Power on again after several minute past.
- e. same as d.

- a. G_2 (screen) voltage drop.
- b. Failure of video circuit. (V)
- c. Failure of (I). (video control block.)
- d. High voltage drop.
- e. failure of CRT (reduction of beam emission)

- a. Check G_2 voltage.
- b. Check video circuit.
IC801, IC805 (video pre/out amp)
- c. Check (I).
IC101 (video process)
IC502 (D/A converter)
connection of P109 (control signal from M Board.)
- d. Check high voltage control circuit. (refer to 1-b.)
- e. Change CRT.

White balance adjustment error.

Readjust white balance using MCP16.

- a. Failure of video circuit.
- b. Lose of connection.

- a. Check video circuit. (refer to 1-2-c.)
- b. Check of connection.
P801 (video signal)
P802 (video control signal)
P804 (power supply of video)

- c. Failure of (I).

- c. Check of (I) (refer to 4-c)

8.1 (When OSD message "NO H SYNC" is appeared.)

8.1

- a. Mis connection of video cable.

- a. Confirm connection of input video signal.

-- SYMPTOM --	-- CHECK --	--POSSIBLE CAUSE--	-- ACTION --
8. Failure of horizontal synchronization		b. Failure of sync. processing circuit. c. Failure of sync detection circuit on MCU Board.	b. Check sync. processing circuit. IC101,102 on (I) P110 (I) and P109 (I) c. Check 3 to 9 pin of IC101 (M)
		8.2 (When OSD message is not appear.) a. Failure of horizontal oscillation circuit on MCU Board. b. Adjustment error of horizontal free running frequency.	8.2 a. Check horizontal oscillation circuit. IC610 (H/V oscillation) b. Readjust horizontal frequency following the adjustment procedure.
9. Failure of vertical synchro.		9.1 (When OSD message "NO V SYNC" is appeared.) a. Mis connection of video cable. b. Failure of sync. processing circuit. c. Failure of sync detection circuit on MCU Board.	9.1 a. Confirm connection of input video signal. b. Check sync. processing circuit. IC101,102 on (I) P109 (I) and P601 (M) c. Check 3 to 9 pin of IC101 (M)
		9.2 (When OSD message is not appear.) a. Failure of vertical oscillation circuit on MCU Board. b. Adjustment error of vertical free running frequency.	9.2 a. Check vertical oscillation circuit. IC610 (H/V oscillation) b. Readjust horizontal frequency following the adjustment procedure.
		a. Failure of SW701 to SW708 (S) b. Failure of MCU Board. (around sw search circuit.) c. Failure of OSD control circuit.	a. Check of SW701 to SW704 (S) and connection P602 (M) b. Check of sw search circuit. (M) RB622 to RB625 (series resistor) Q501 (SW scan) c. Check of OSD control circuit. IC103 (PLL oscillator) IC802 (OSD controller) P110 (especially 6 to 10pin)
10. Failure of OSD		a. Failure of horizontal size control circuit. b. Failure of horizontal chopper circuit. c. Failure of connection of horizontal DY d. Adjustment error	a. Check of horizontal size control circuit. Q622 to Q528 (M) J201 18pin (HS-OUT) b. Check of horizontal chopper circuit. Q350 (H Chopper) (D) and around circuit. c. Check of horizontal DY connection. P350 (horizontal DY) (D) d. Readjust horizontal size using MCP16 or front panel
11. Failure of horizontal size (horizontal size is too small or too large)		a. Failure of vertical size control circuit.	a. Check of vertical size control circuit. (M) IC610 (vertical size control) 17 pin of J202
12. Failure of vertical size (vertical size is too small or too large)			

12. vertical size is too small or too large

- b. Failure of vertical size output.
- c. Failure of connection of vertical DY
- d. Adjustment error

- b. Check of V output (D)
IC201 (vertical output)
Q201 (V pumping up)
L202 (V power filter)
- c. Check of connection of vertical P203 (vertical DY)
- d. Readjust vertical size

13. Horizontal position is not center

- 13.1 (When failure of horizontal raster position.)
 - a. Failure of horizontal raster position control circuit.
 - b. Failure of horizontal raster position drive circuit.
 - c. Adjustment error
- 13.2 (When failure of horizontal phase (video position) sifter
 - a. Failure of phase silt control circuit.
 - b. Adjustment error

- 13.1
 - a. Check of control circuit (M)
IC301 (D/A converter)
7 pin of P202 (M)
 - b. Check of h position out
Q354 through Q355 (h post out)
Q355, Q356 (h post rectifier)
R354, R355 (fusing resistor)
T350 (H output transformer)
 - c. Readjust using MCP16
(This item can only adjust by MCP16)
- 13.2
 - a. Check of phase silt circuit. (M)
 - b. Readjust using MCP16 or front panel.

14. Vertical position is not center.

- a. Failure of vertical position control circuit.
- b. Failure of vertical position output circuit.
- c. Adjustment error

- a. Check of position control circuit. (M)
IC607 (D/A converter)
15 pin of J202
- b. Check of position output circuit. (D)
pin 4 of IC201 (V-amp)
- c. Readjust using MCP16 or front panel.

7.2 Appendix

Check of MCU protection

When the monitor is power on, if power indicate LED lights green about 1 second and next it lights red a moment and power down, then MCU controlled protector has operated and shutdown the power supply.

As explain on circuit description section, the MCU of this monitor is searching several circuit information of monitor. These information is as follows.

1. Horizontal size information. (under or over)
2. High Voltage information. (under or over)
3. Anode beam current information. (over)
4. +B current information. (over)
5. +B voltage information. (over)
6. EEPROM failure or data error

If the sensing voltage of information has been over (or under) than setting value by something cause (ex failure of component), the MCU triggers the PS3 signal (SWR shutdown signal) and shutdown power supply. Before shutting down, the MCU writes the code of protection in the EEPROM.

To resolve the cause of shutdown, it is needed to read this code. But in normal mode, power of the monitor is down, there is special mode.

How to know the shutdown cause.

1. Remove back cabinet of the monitor.
2. Jumper the test pads shown fig 7.2.1 by soldering.
3. Power the monitor on, then power indicate LED will light red. (Under this state, the monitor operate PS2 mode.)
4. Connect the communication unit and run MCP7
5. Select <Check - LastProtect> menu.
6. The window of LastProtect will appear and you can know the cause of shutdown on the Data 2. (Data 1 has already written when the factory protection check.)
7. When the cause has known, repair or readjust the monitor.
8. After repairing the monitor, never forget to remove the jumper of test pads.

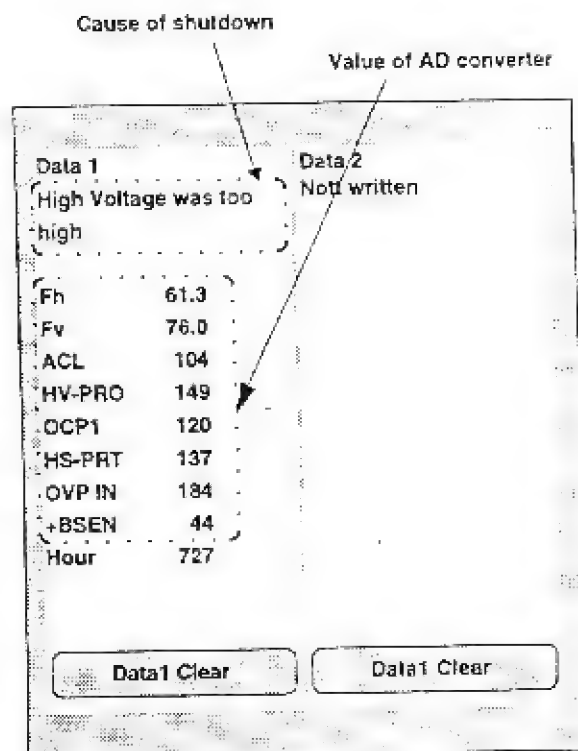


Fig 7.2.2 LastProtect window

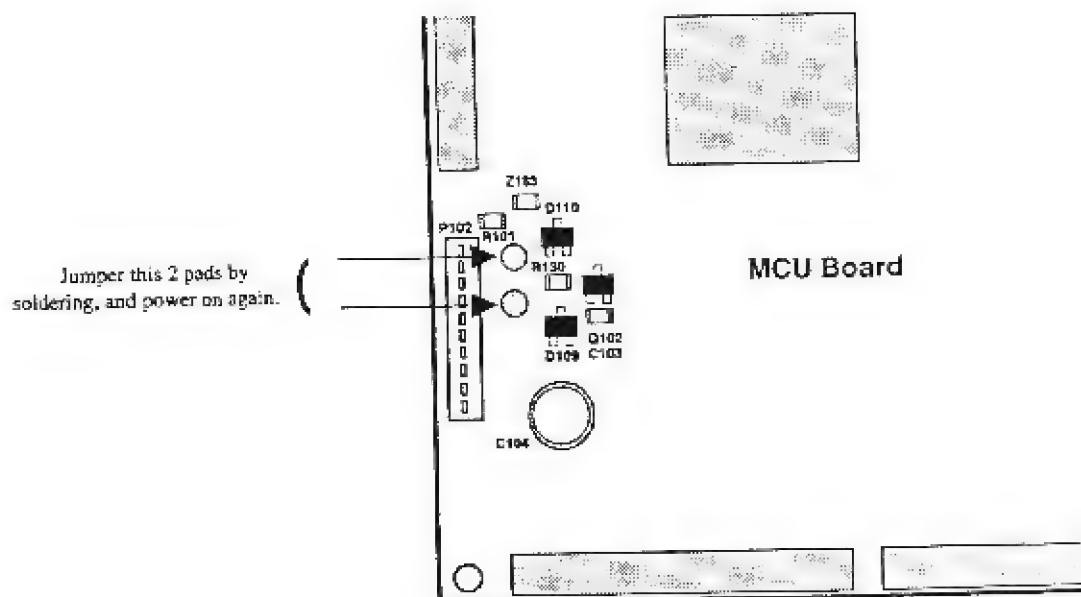
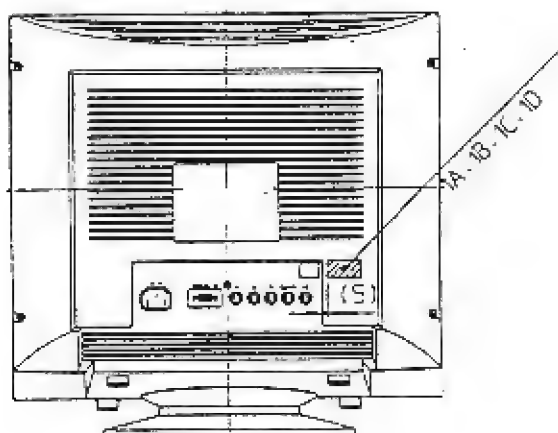
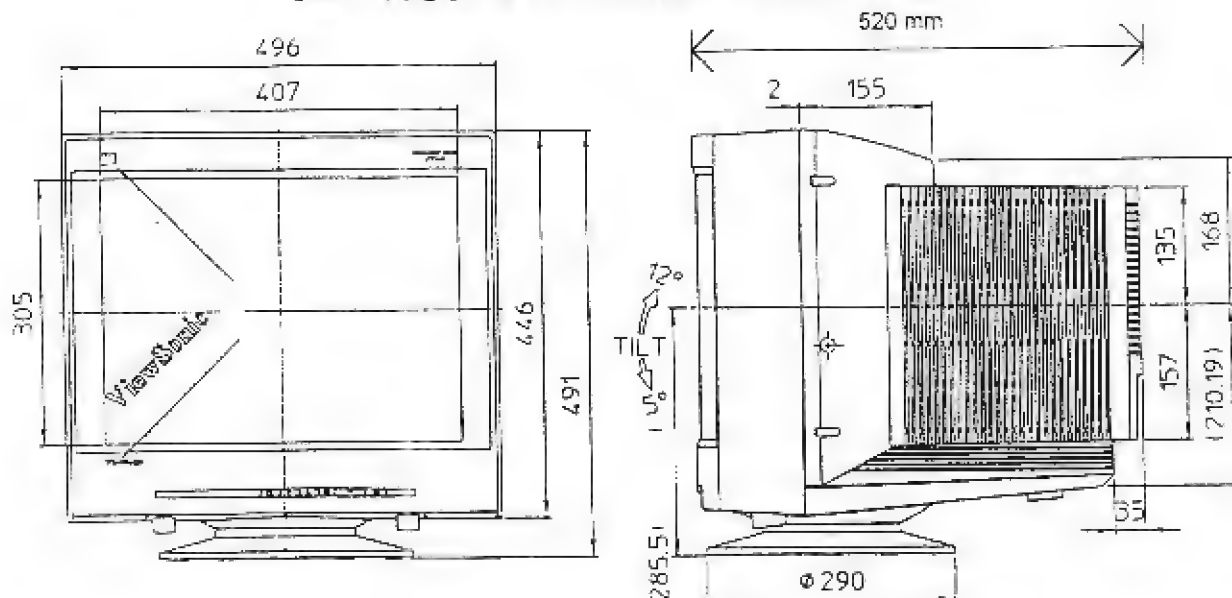


Fig 7.2.1 Jumpering point

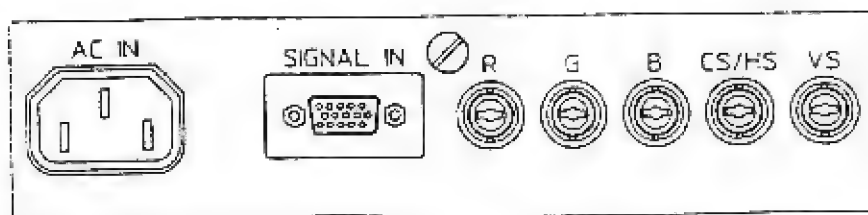
SECTION 8 OUTLINE DRAWING



DETAIL OF FRONT PANEL



DETAIL OF REAR CONNECTOR PANEL



SECTION 9 WAVE FORMS

The waveforms are measured following condition.

Horizontal frequency: 80.0kHz

Vertical frequency 75Hz

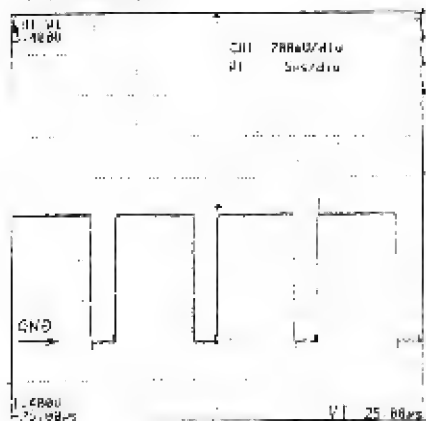
Video mode All White pattern for wave forms are V1,V2 and D12, others are cross hatch non-revers pattern.

Luminance MAX

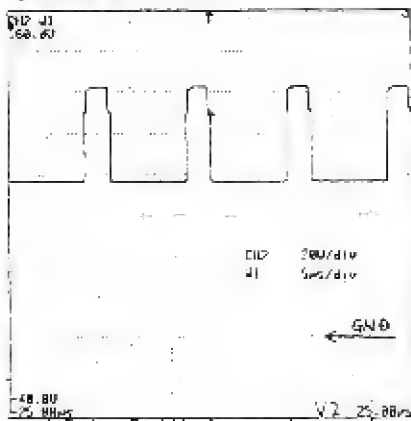
Line Input 100V AC

WAVE FORM 1: DEFLECTION BLOCK

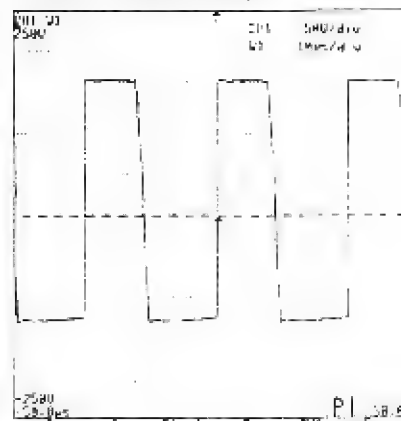
V1:R Video input



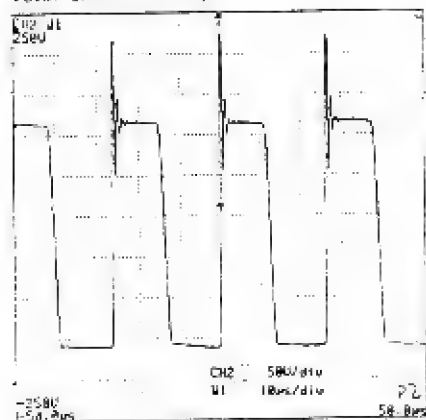
V2:Cathode of 1 Electrode



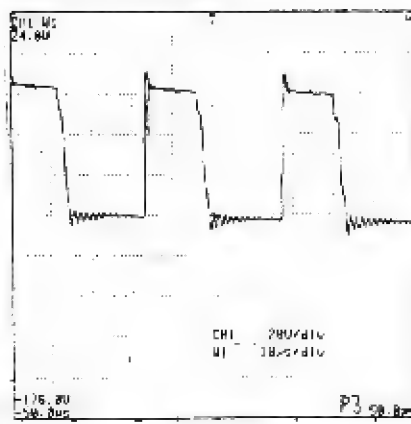
P1:BI ST transformer output



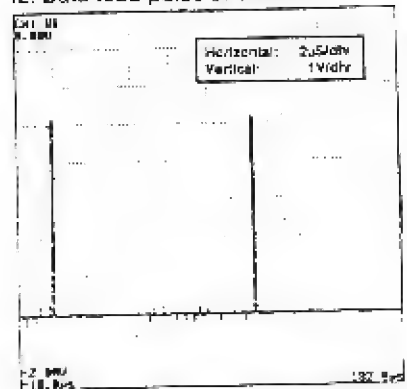
P2:ST control IC output



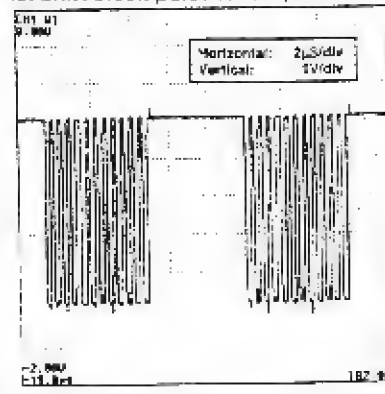
P3:ST drive winding output



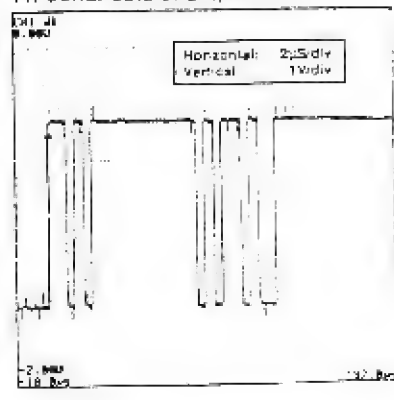
I2: Data load pulse of video DA



I3: Shift clock pulse for DA, PLL IC

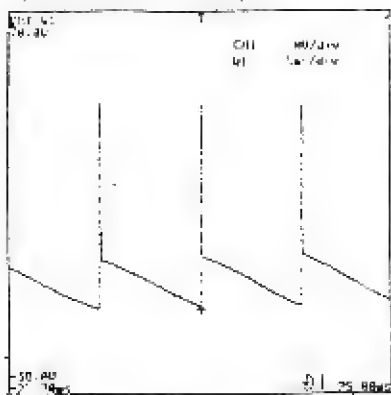


I4: Serial data of DA, PLL IC

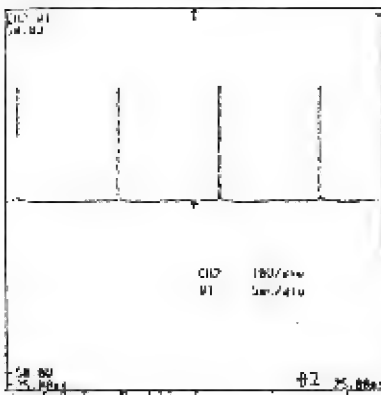


WAVE FORM 2: DEFLECTION BLOCK

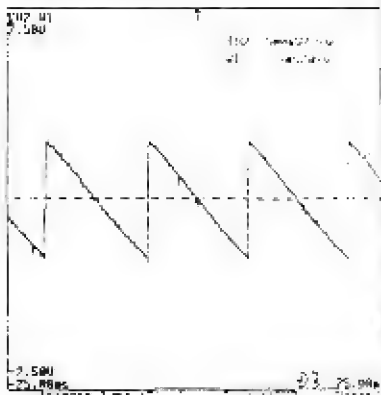
D1: Vertical Deflection output



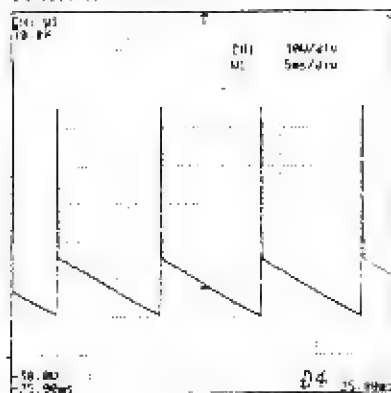
D2: Vertical Deflection pump up



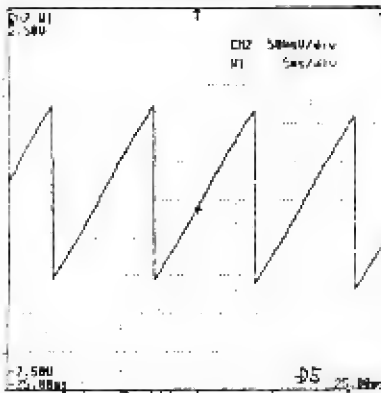
D3: Vertical DY return line



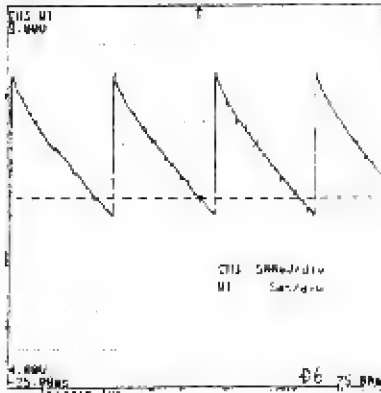
D4: Vertical DY test line



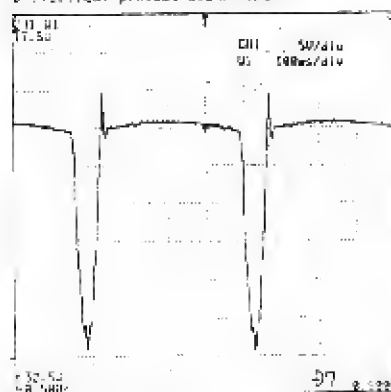
D5: Vertical linear correction



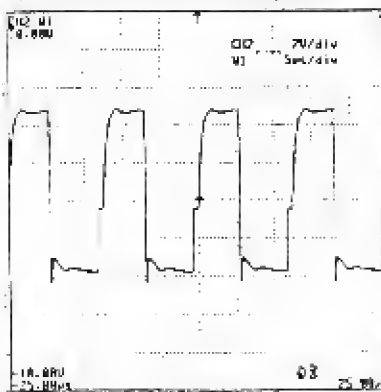
D6: AEP(VLP) cancel pulse



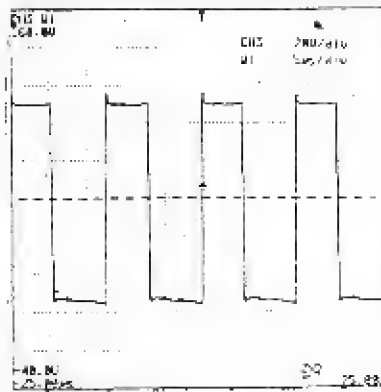
D7: Vertical protect blanking pulse



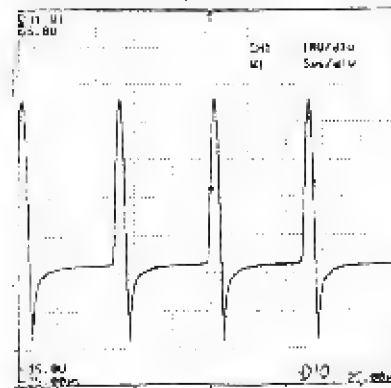
D8: Horizontal deflection drive pulse



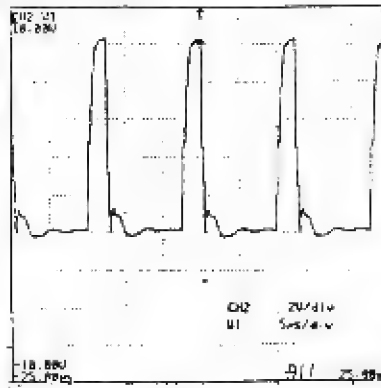
D9: Horizontal size control pulse (to driver)



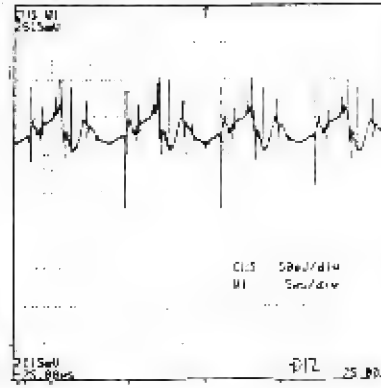
D10: Horizontal APC pulse



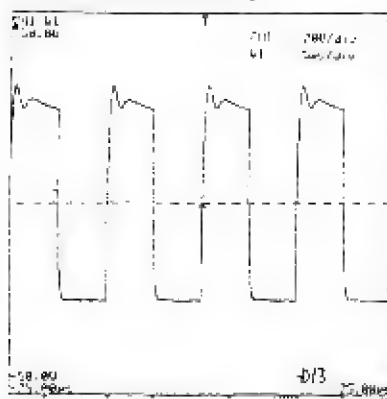
D11: DY drive pulse



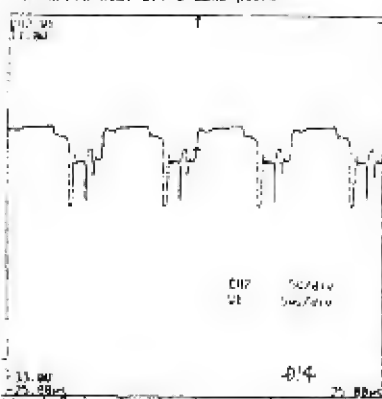
D12: DY sensing voltage



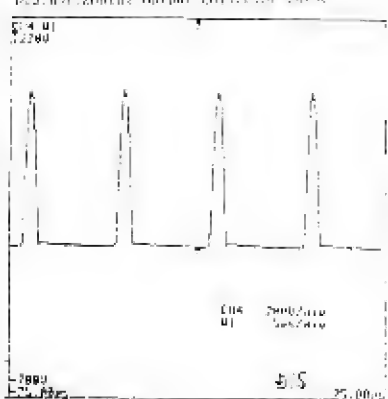
D1:Horizontal drive drain pulse



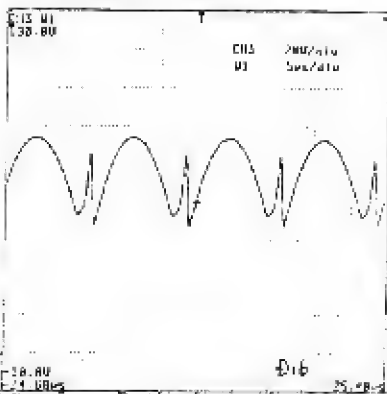
D7:Horizontal drive base pulse



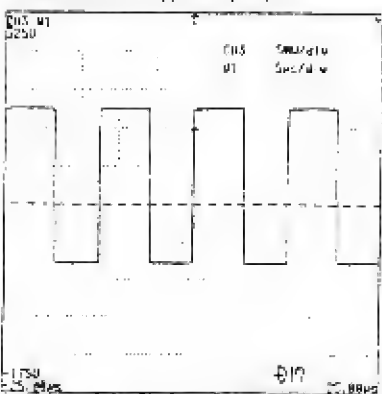
D5:Horizontal output collector pulse



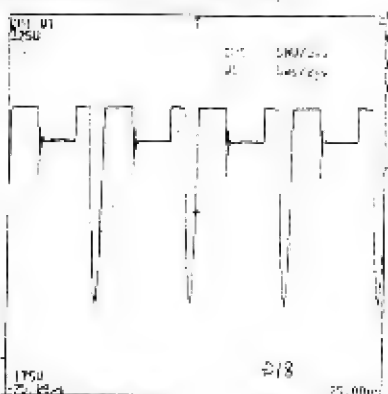
D16:Horizontal EY return line



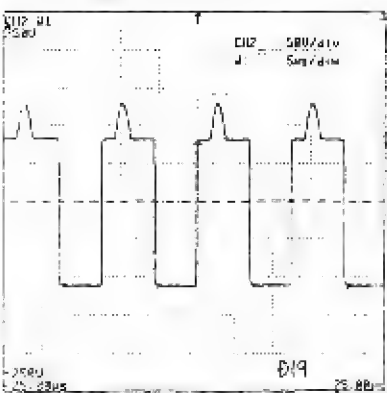
D17:Horizontal chopper output pulse



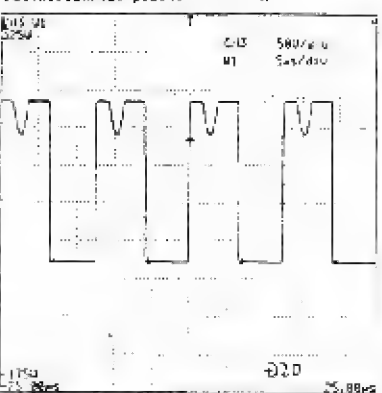
D18:Horizontal output trans output



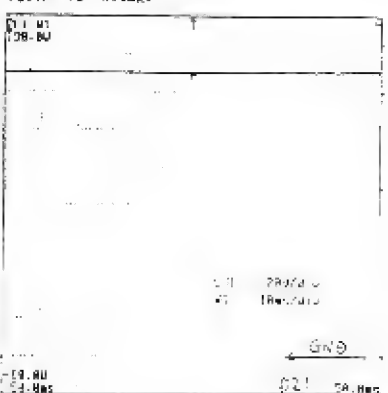
D19:Horizontal position winding



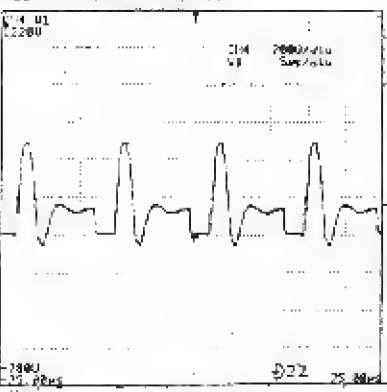
D20:Horizontal position winding



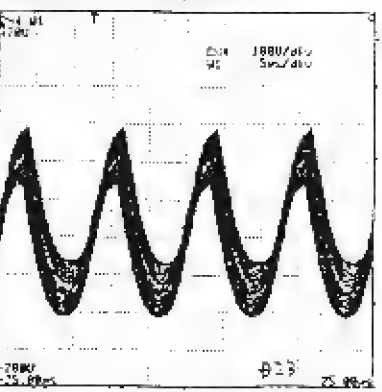
D21:V18 voltage

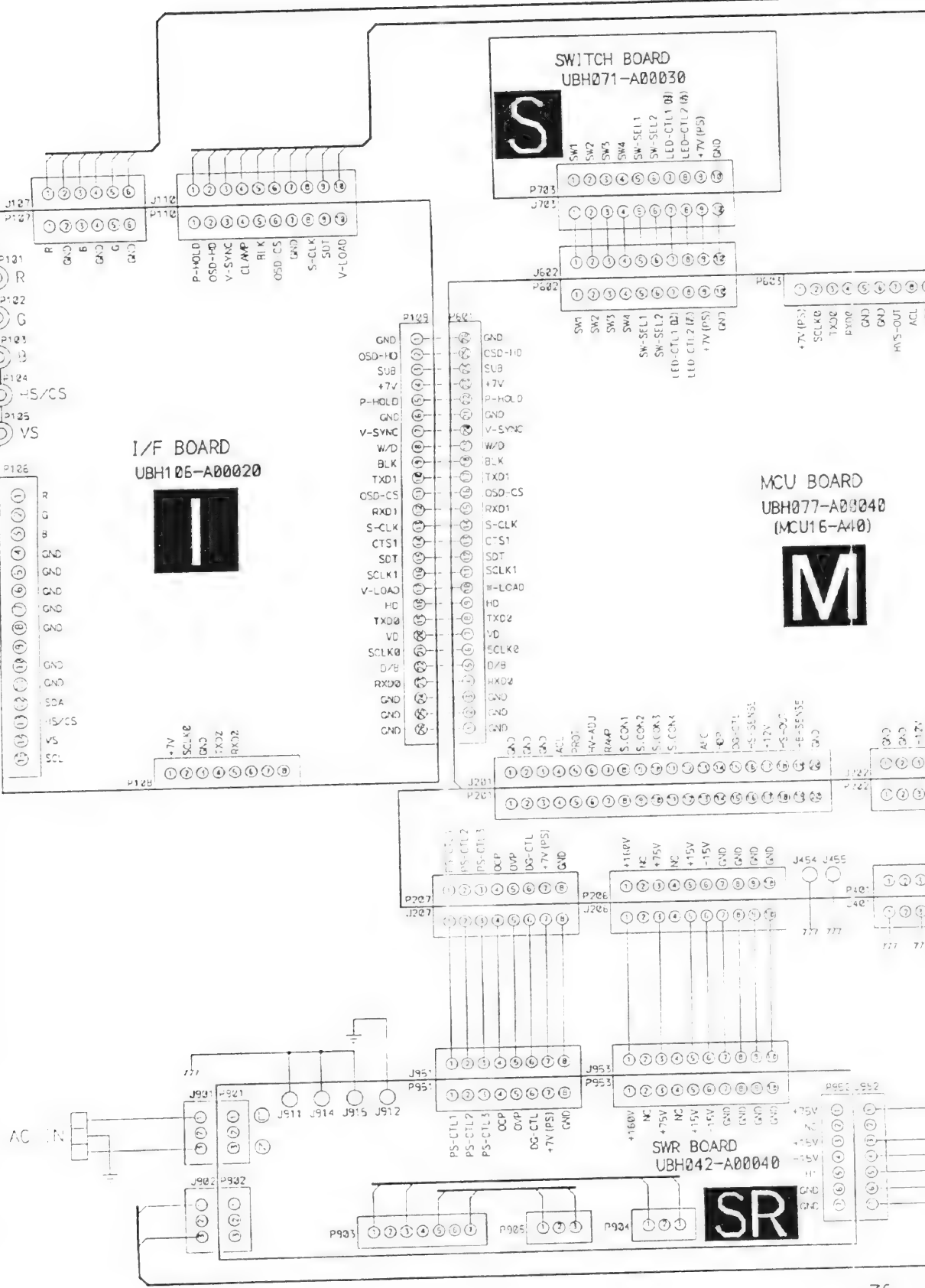


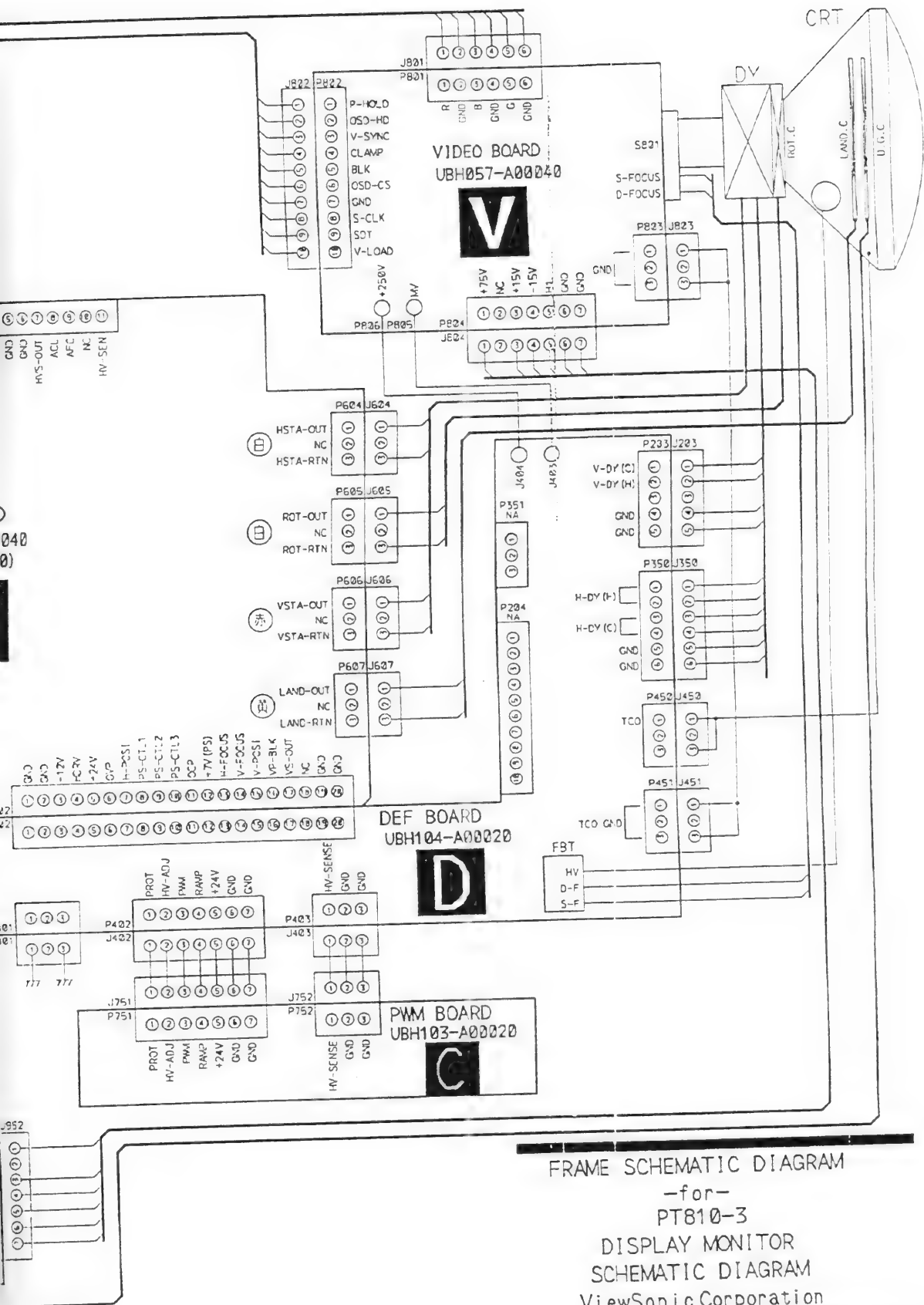
D22:VY output drain pulse



D23:Dynamic focus output(H rate)

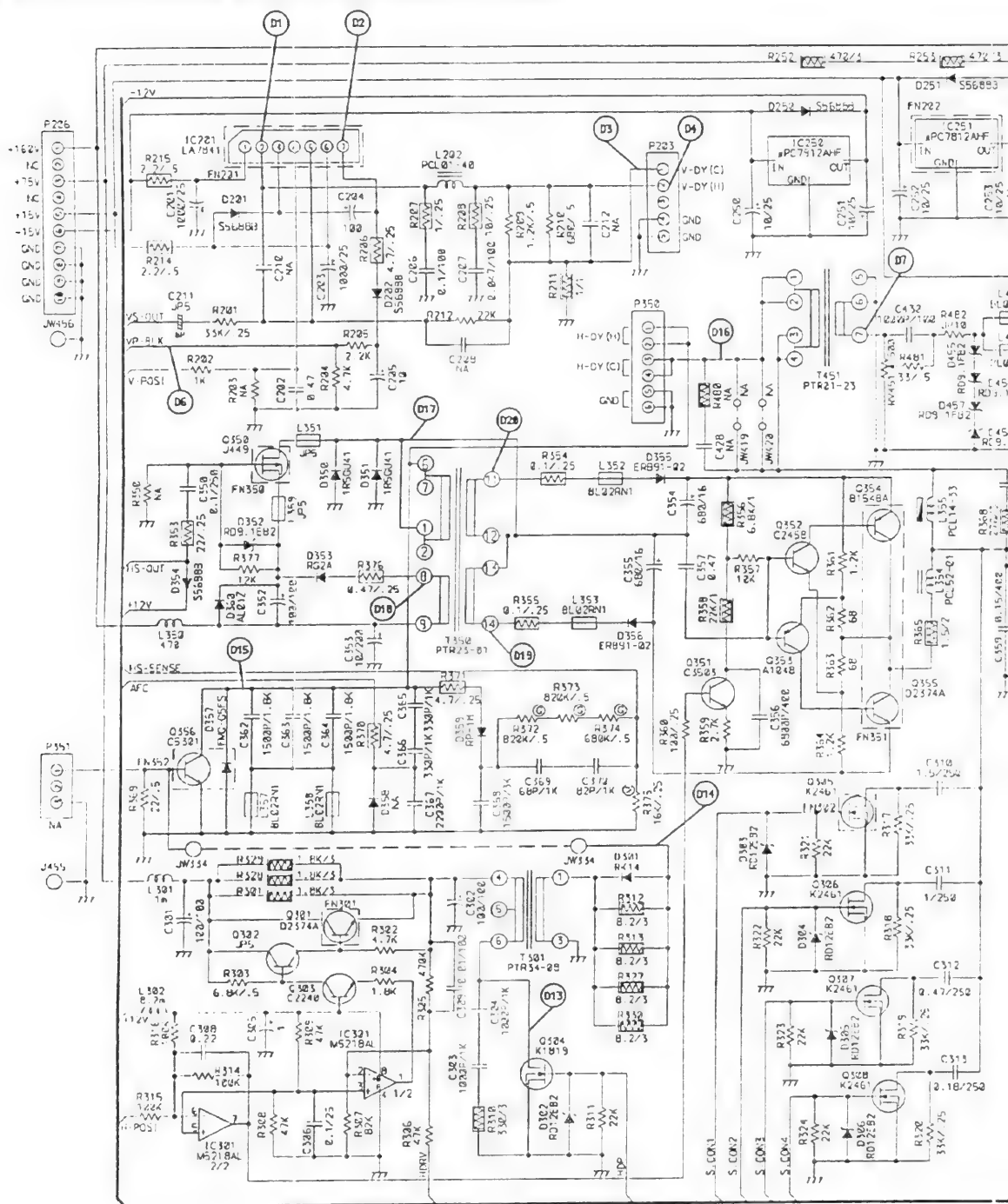






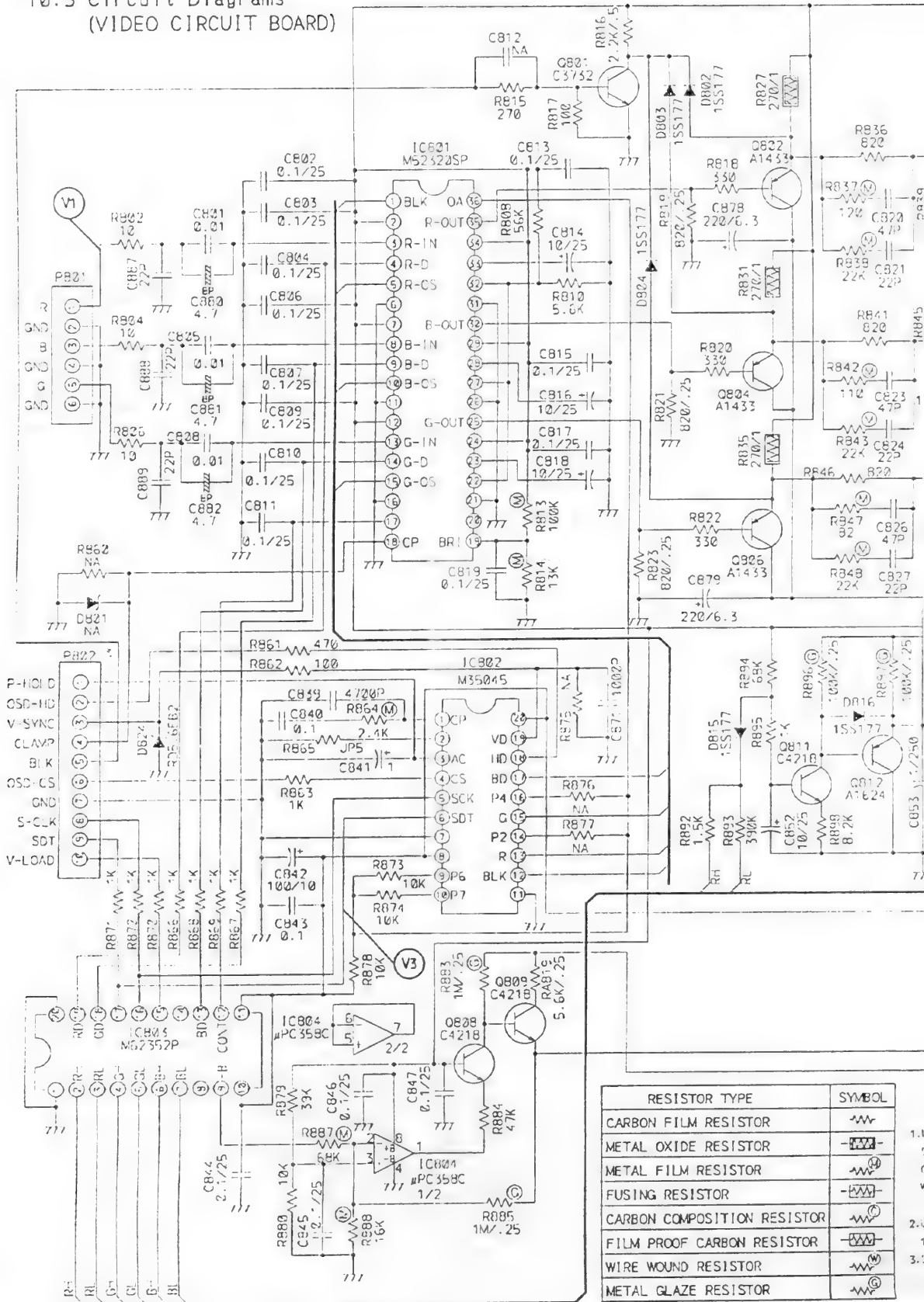


10.3 Circuit Diagrams (DEFLECTION CIRCUIT BOARD)

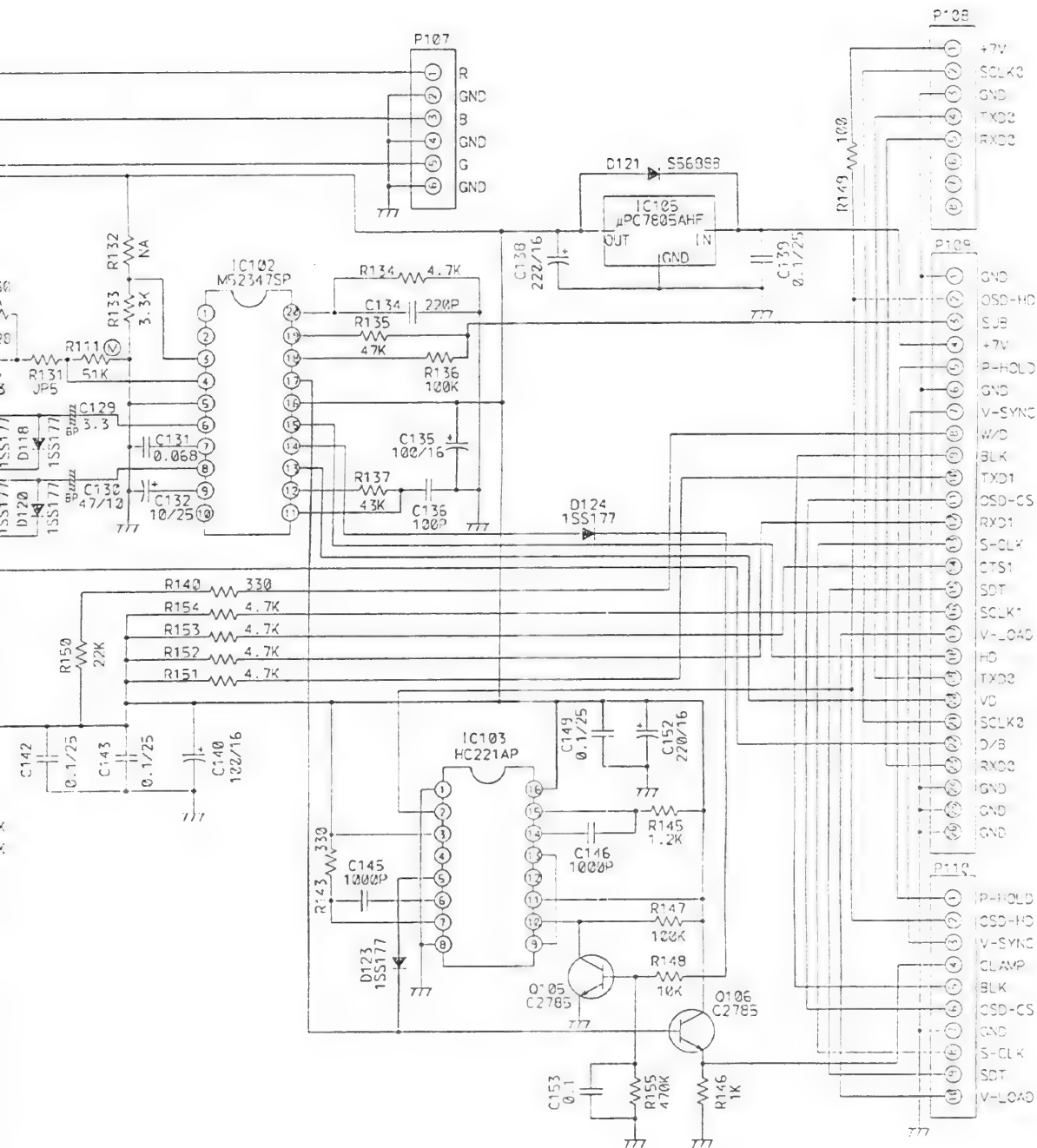


RESISTOR TYPE	SYMBOL
CARBON FILM RESISTOR	A
METAL OXIDE RESISTOR	-B
METAL FILM RESISTOR	A
FUSING RESISTOR	-B
CARBON COMPOSITION RESISTOR	A
FILM PROOF CARBON RESISTOR	-B
WIRE WOUND RESISTOR	A
METAL GLAZE RESISTOR	A

10.3 Circuit Diagrams (VIDEO CIRCUIT BOARD)



RESISTOR TYPE	SYMBOL
CARBON FILM RESISTOR	
METAL OXIDE RESISTOR	
METAL FILM RESISTOR	
FUSING RESISTOR	
CARBON COMPOSITION RESISTOR	
FILM PROOF CARBON RESISTOR	
WIRE WOUND RESISTOR	
METAL GLAZE RESISTOR	



GENERAL SCHEMATIC NOTES:

INDICATED. ALL CAPACITOR VALUES ARE IN MICRO (μ) FARADS
VALUES ARE IN OHMS 1/4W 5%. FOR COMPLETE DESCRIPTION
REFER TO PARTS LIST.

100 OHMS. 1/4W 5%
FARADS

INDICATED. ALL INDUCTOR VALUES ARE IN MICRO (μ) HENRY
DESCRIPTION OF COMPONENTS, REFER TO PARTS LIST.
ENCLOSURES HEAT SINK MOUNTED DEVICE.

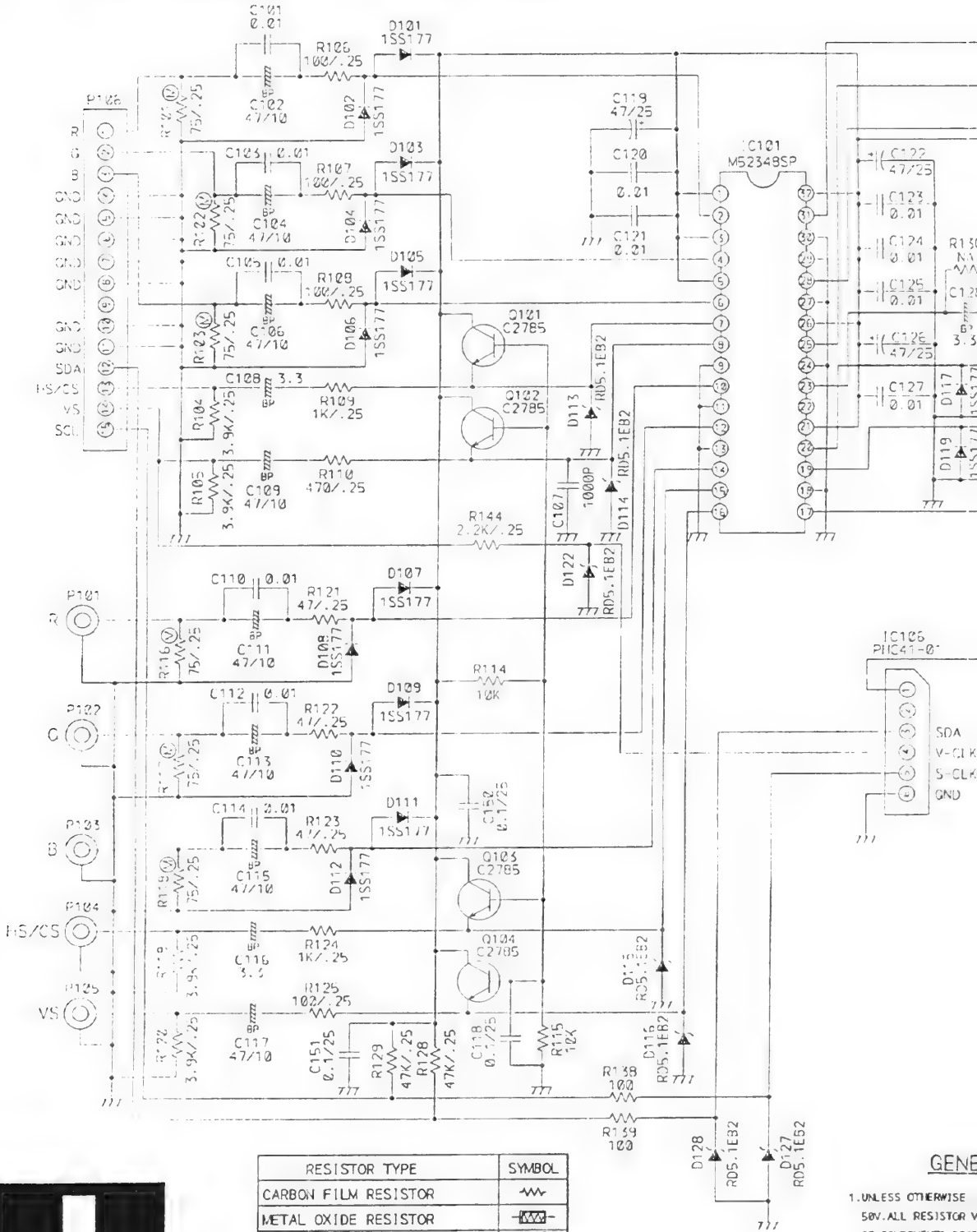
Interface CIRCUIT BOARD

-for-
PT810-3

DISPLAY MONITOR
SCHEMATIC DIAGRAM

ViewSonic Corporation

10.3 Circuit Diagrams(INTERFACE CIRCUIT BOARD)

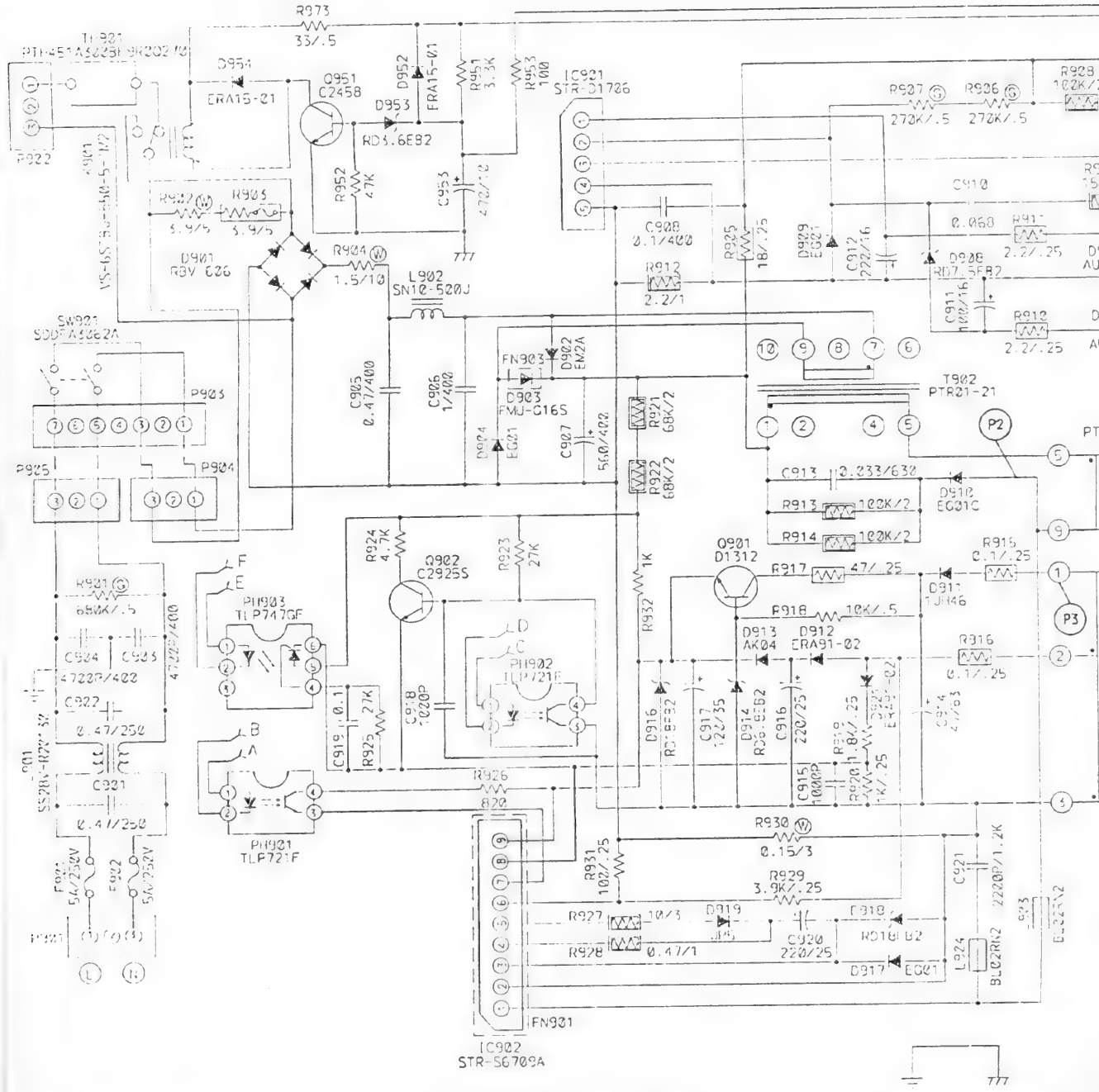


RESISTOR TYPE	SYMBOL
CARBON FILM RESISTOR	
METAL OXIDE RESISTOR	
METAL FILM RESISTOR	
FUSING RESISTOR	
CARBON COMPOSITION RESISTOR	
FILM PROOF CARBON RESISTOR	
WIRE WOUND RESISTOR	
METAL GLAZE RESISTOR	

1. UNLESS OTHERWISE
50V. ALL RESISTOR V
OF COMPONENTS, RE
WHERE
k: 1000
p: 100
2. UNLESS OTHERWISE
10X FOR COMPLETE
3. DASHED LINE BOX

GENE

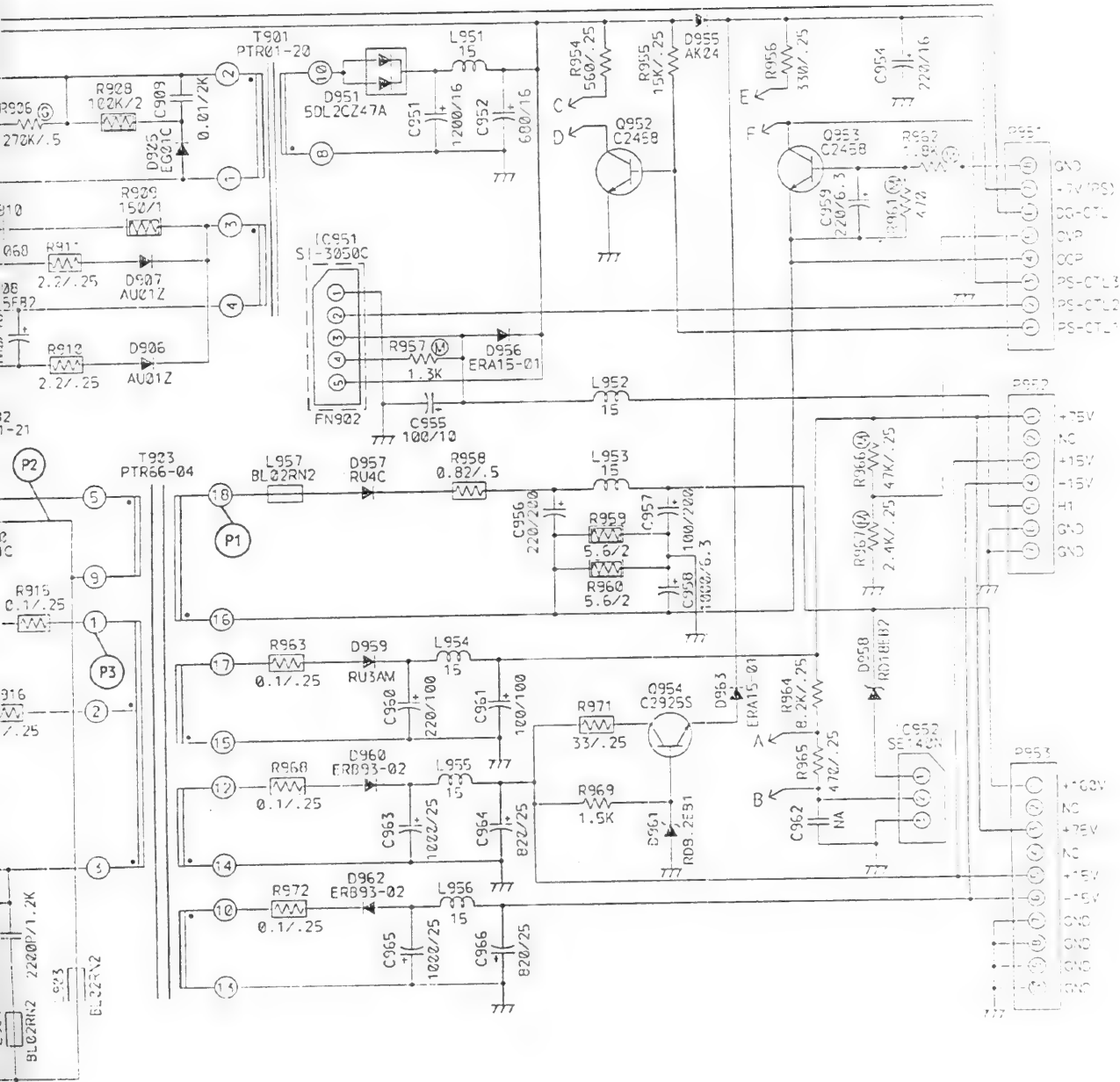
10.3 Circuit Diagrams (SW Regulator CIRCUIT BOARD)



RESISTOR TYPE	SYMBOL
CARBON FILM RESISTOR	
METAL OXIDE RESISTOR	
METAL FILM RESISTOR	
FUSING RESISTOR	
CARBON COMPOSITION RESISTOR	
FILM PROOF CARBON RESISTOR	
WIRE WOUND RESISTOR	
METAL GLAZE RESISTOR	

GENERAL SCHEMATIC NO.

- UNLESS OTHERWISE INDICATED, ALL CAPACITOR VALUES 50V. ALL RESISTOR VALUES ARE IN OHMS 1/10W 5% FOR OF COMPONENTS, REFER TO PARTS LIST.
WHERE
1: 1000 OHMS, 1: 10000 OHMS
D: 100 FARADS
- UNLESS OTHERWISE INDICATED, ALL INDUCTOR VALUES 10X. FOR COMPLETE DESCRIPTION OF COMPONENTS, REFER TO PARTS LIST.
- DASHED LINE BOX ENCLOSES HEAT SINK MOUNTED DEVS.



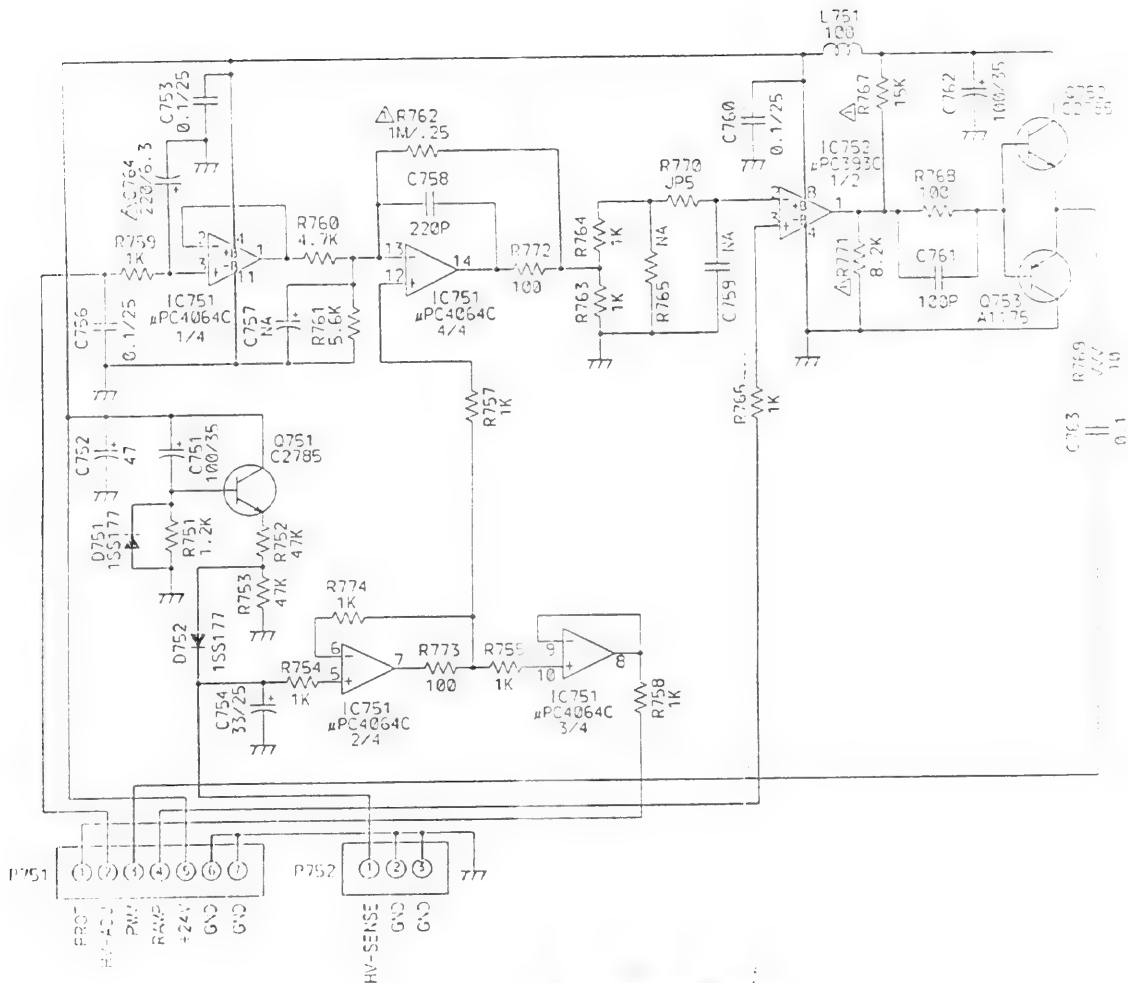
SCHEMATIC NOTES:

ALL CAPACITOR VALUES ARE IN MICRO(μ) FARADS
 ARE IN OHMS 1/OW 5X.FOR "COMPLETE DESCRIPTION
 PARTS LIST.
 1000Ω OHMS

ALL INDUCTOR VALUES ARE IN MICRO(μ) HENRY
 OF COMPONENTS, REFER TO PARTS LIST.
 HEAT SINK MOUNTED DEVICE.

SW Regulator CIRCUIT BOARD
 -for-
PT810-3
DISPLAY MONITOR
SCHEMATIC DIAGRAM
 ViewSonic Corporation





GENERAL SCHEMATIC NOTES:

1. UNLESS OTHERWISE INDICATED, ALL CAPACITOR VALUES ARE IN MICRO(μ) FARADS
50V. ALL RESISTOR VALUES ARE IN OHMS 1/6W 5% FOR COMPLETE DESCRIPTION OF COMPONENTS, REFER TO PARTS LIST.
WHERE k=1000 OHMS, M=10000 OHMS
p=** FARADS
2. UNLESS OTHERWISE INDICATED, ALL INDUCTOR VALUES ARE IN MICRO(μ) HENRY
10X FOR COMPLETE DESCRIPTION OF COMPONENTS, REFER TO PARTS LIST.
3. DASHED LINE BOX ENCLOSES HEAT SINK MOUNTED DEVICE.

SWITCH & PWM CIRCUIT BOARD

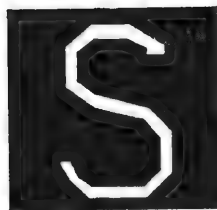
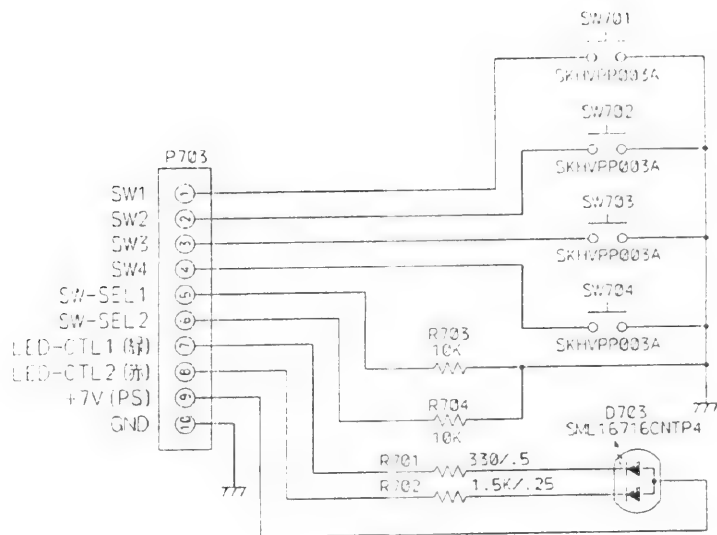
-for-

PT810-3

DISPLAY MONITOR
SCHEMATIC DIAGRAM

ViewSonic Corporation

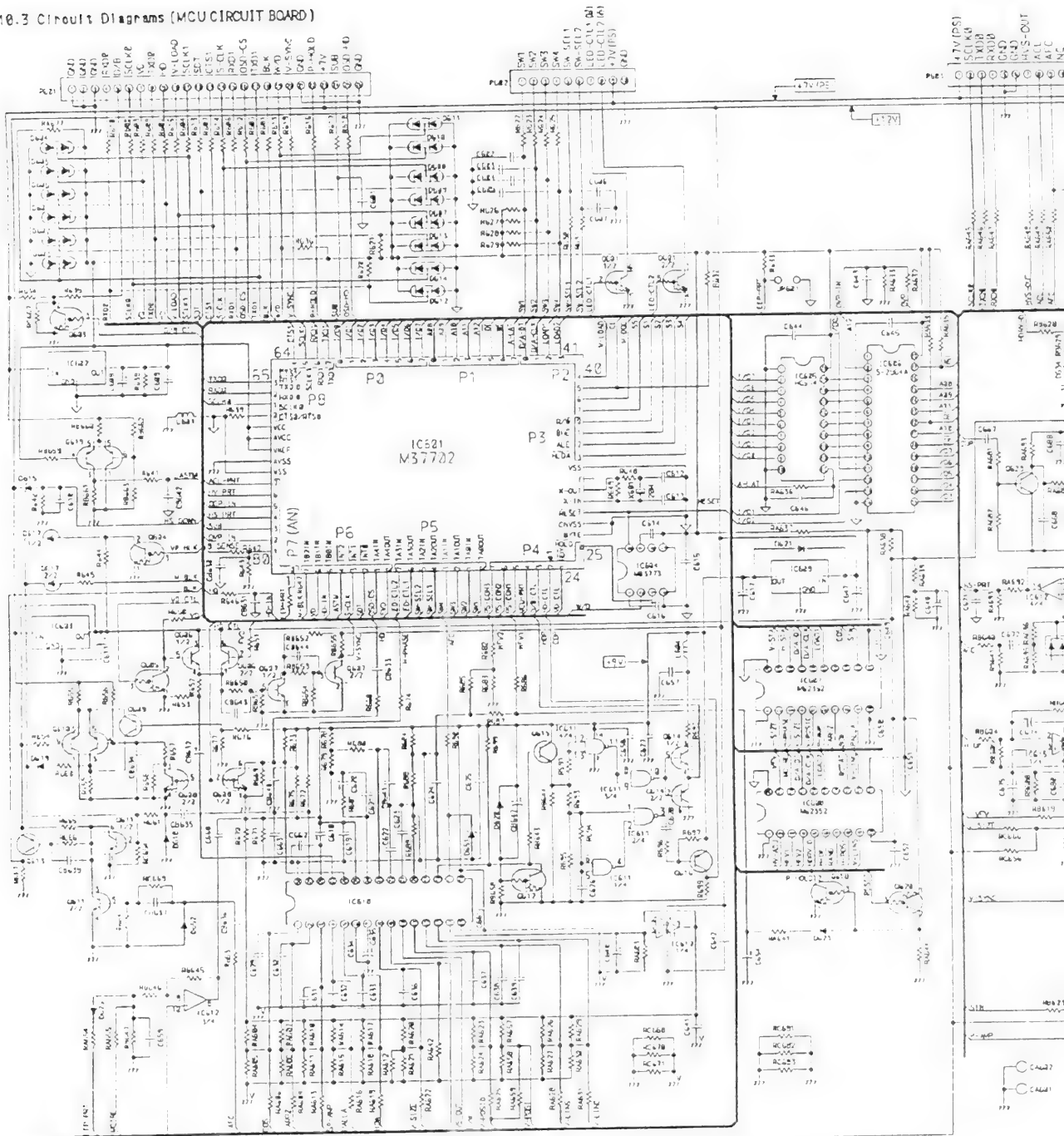
10.3 Circuit Diagrams(SW&CANCEL CIRCUIT BOARD)

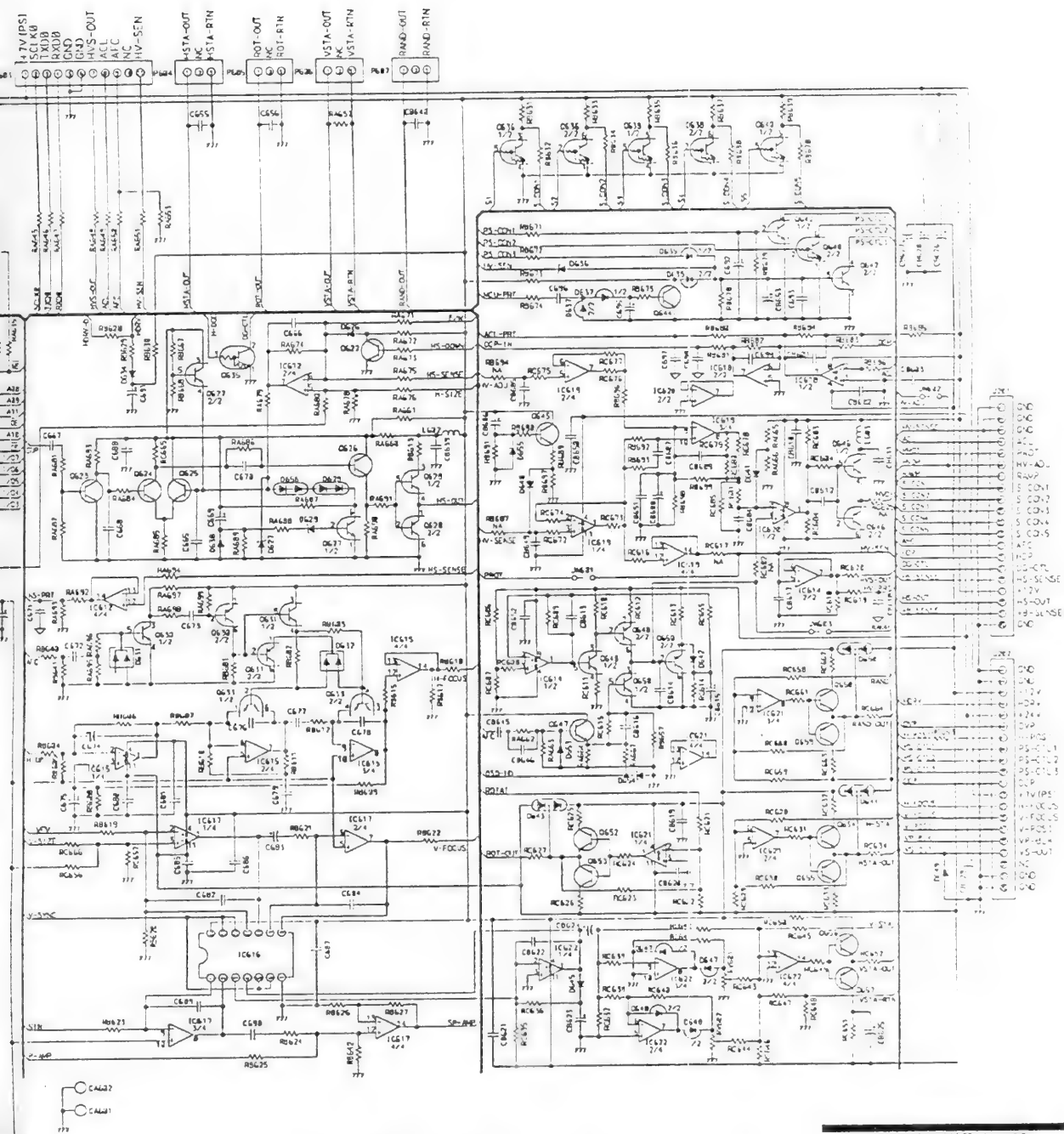


RESISTOR TYPE	SYMBOL
CARBON FILM RESISTOR	
METAL OXIDE RESISTOR	
METAL FILM RESISTOR	
FUSING RESISTOR	
CARBON COMPOSITION RESISTOR	
FILM PROOF CARBON RESISTOR	
WIRE WOUND RESISTOR	
METAL GLAZE RESISTOR	

1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/4W. FOR COMPLETE LIST OF COMPONENTS, SEE THE PARTS LIST.
2. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/4W. FOR COMPLETE LIST OF COMPONENTS, SEE THE PARTS LIST.
3. DASHED LINE BOXES INDICATE OPTIONAL COMPONENTS.

10.3 Circuit Diagrams (MCU CIRCUIT BOARD)

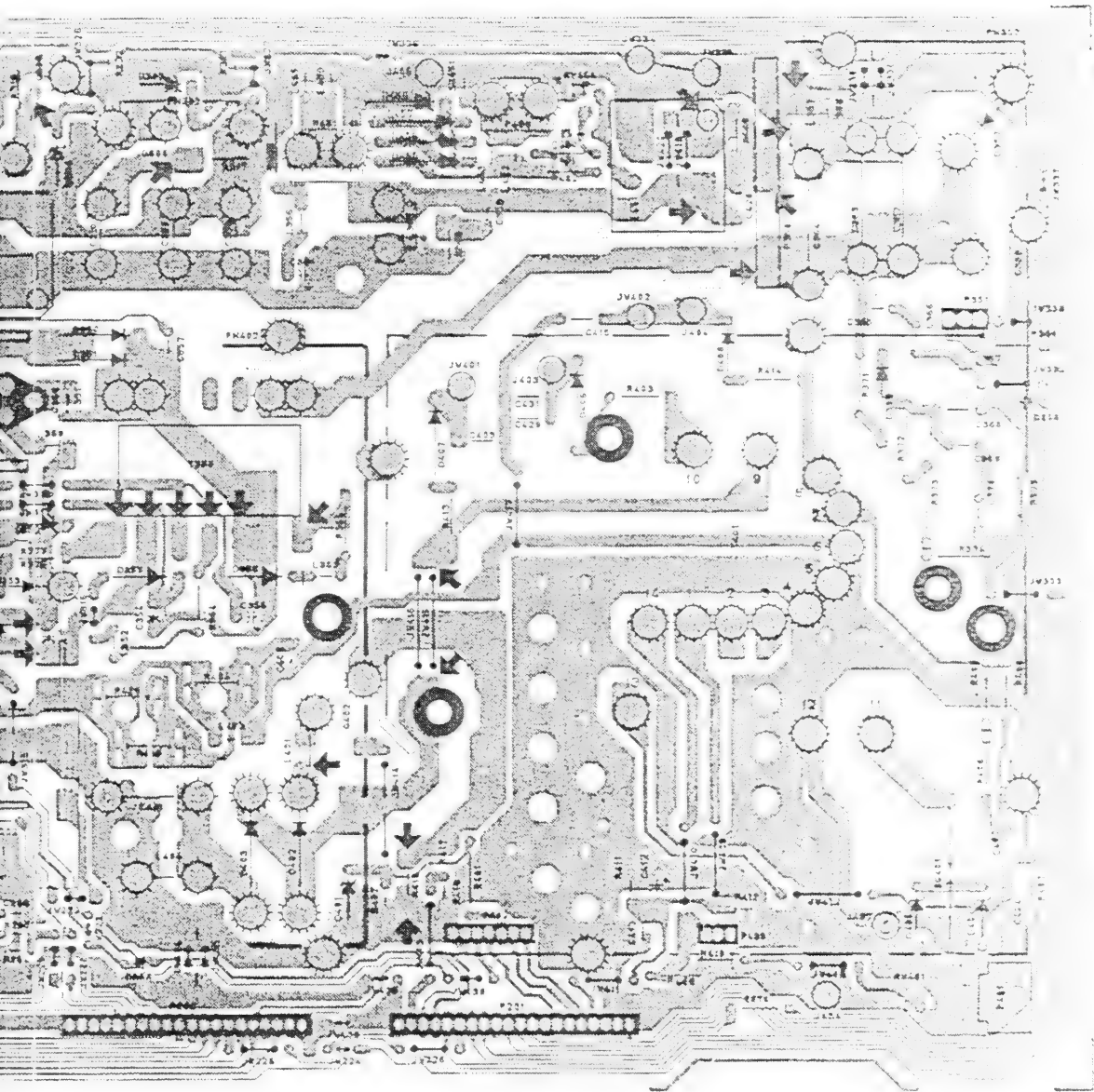




MCU CIRCUIT BOARD
-for-
PTB10-3

DISPLAY MONITOR
SCHEMATIC DIAGRAM
ViewSonic Corporation

PBH104-1



Deflection CIRCUIT BOARD

- for -

PTA100

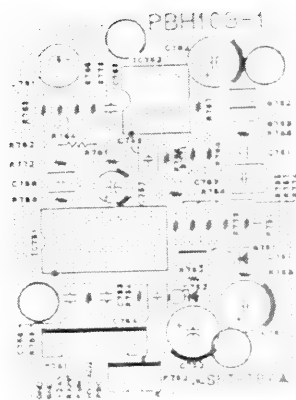
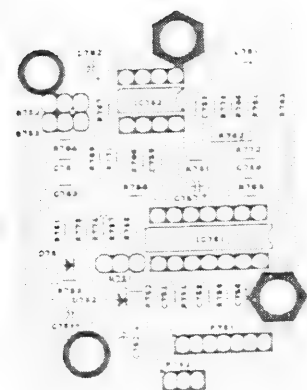
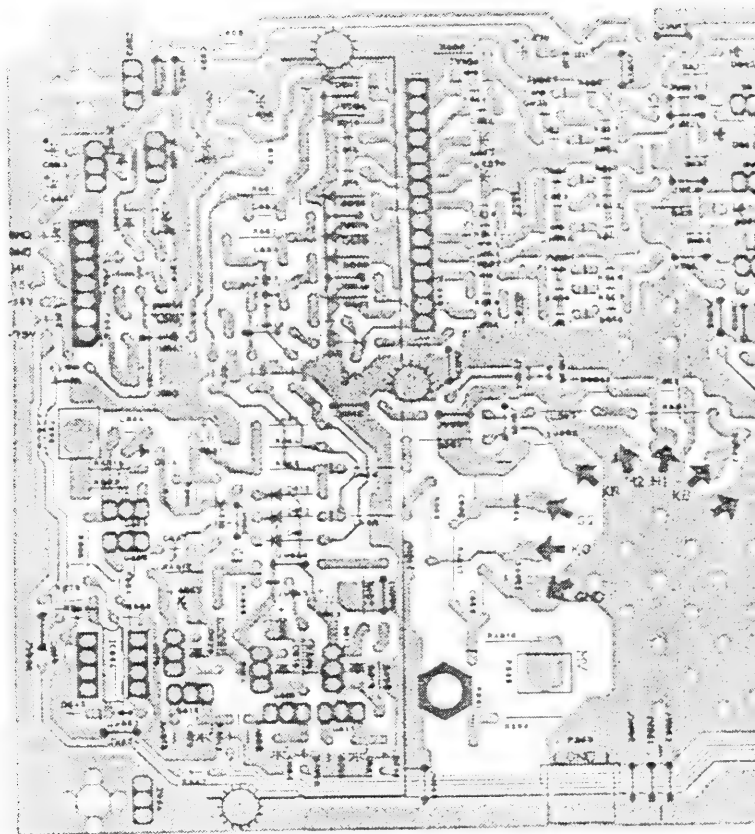
COLOR CRT

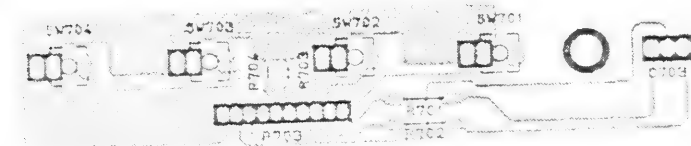
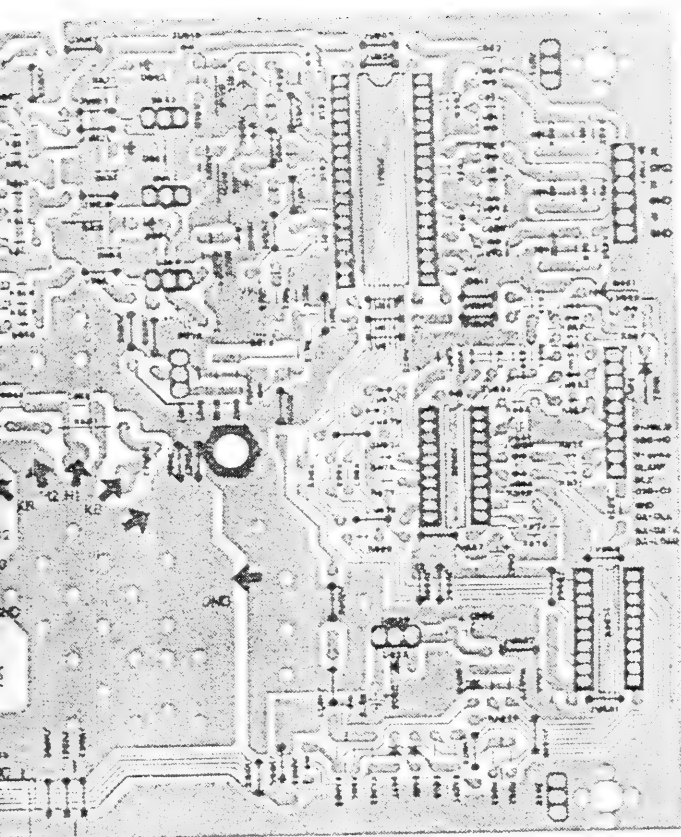
DISPLAY MONITOR

Part No. 104-1

ViewSonic Corporation



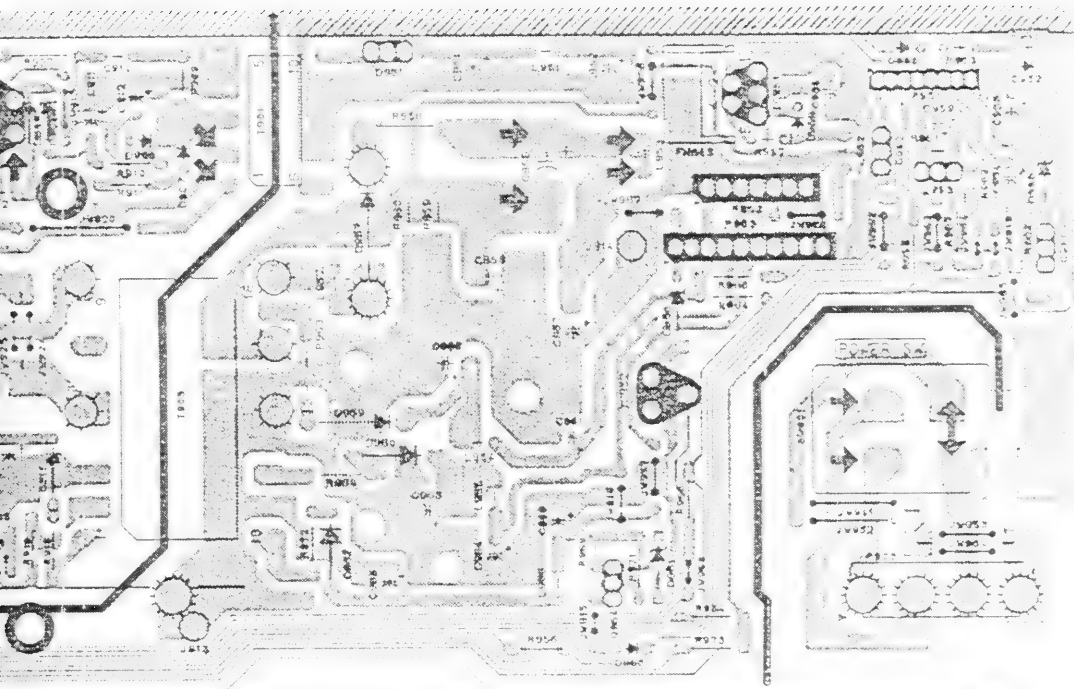




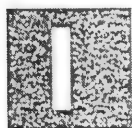
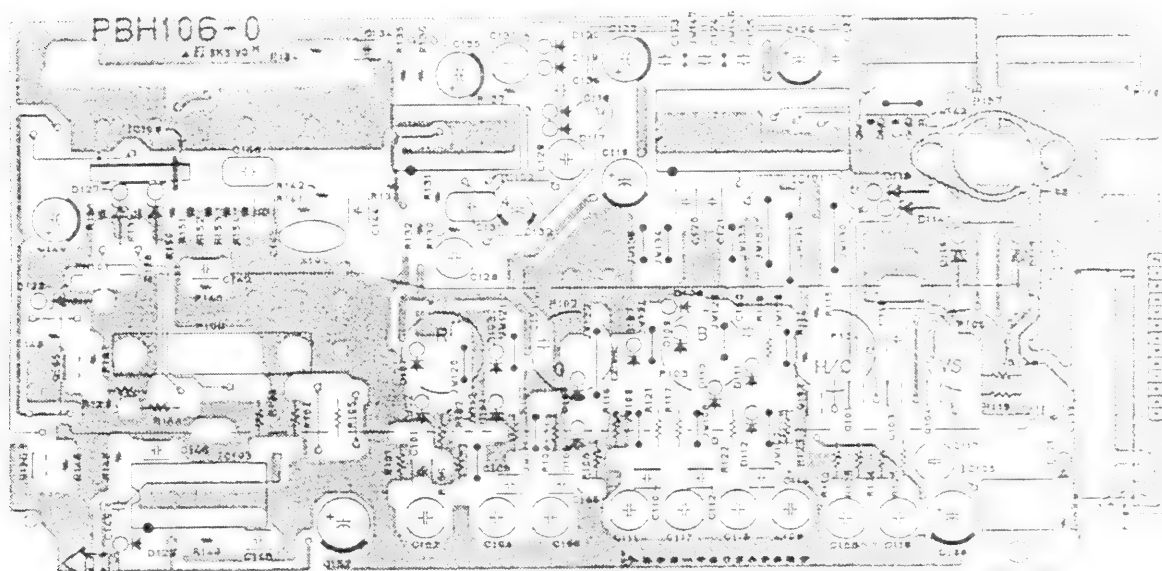
Video & SW CIRCUIT
& PWM CIRCUIT BOARD

REPAIR GUIDE FOR
DISPLAY MONITOR
Model: 9000-0000

ViewSonic Corporation



SR



SOLDERING SIDE

I & SR CIRCUIT BOARD

100%

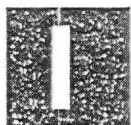
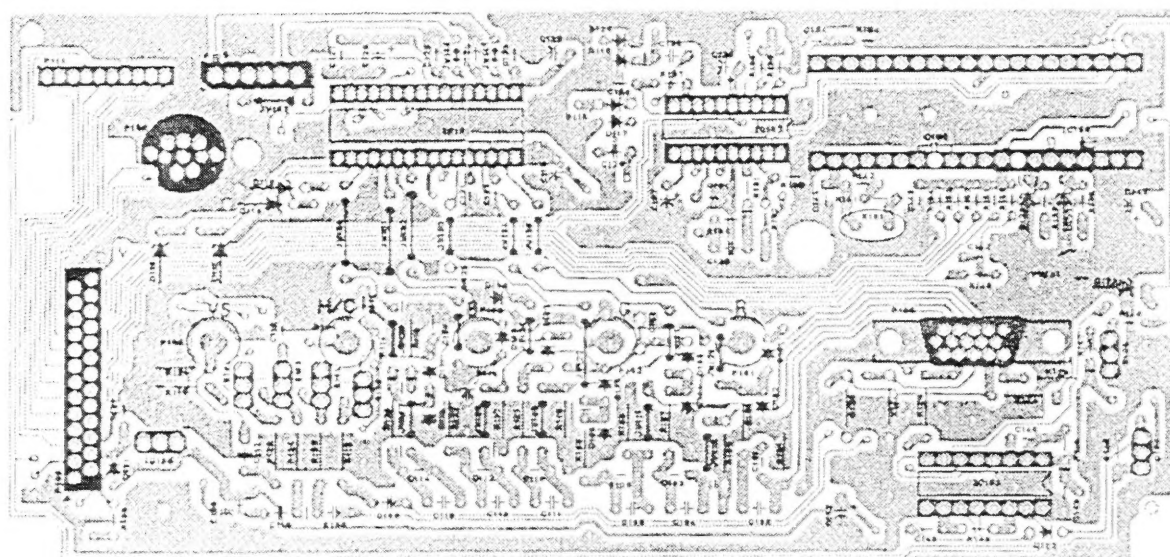
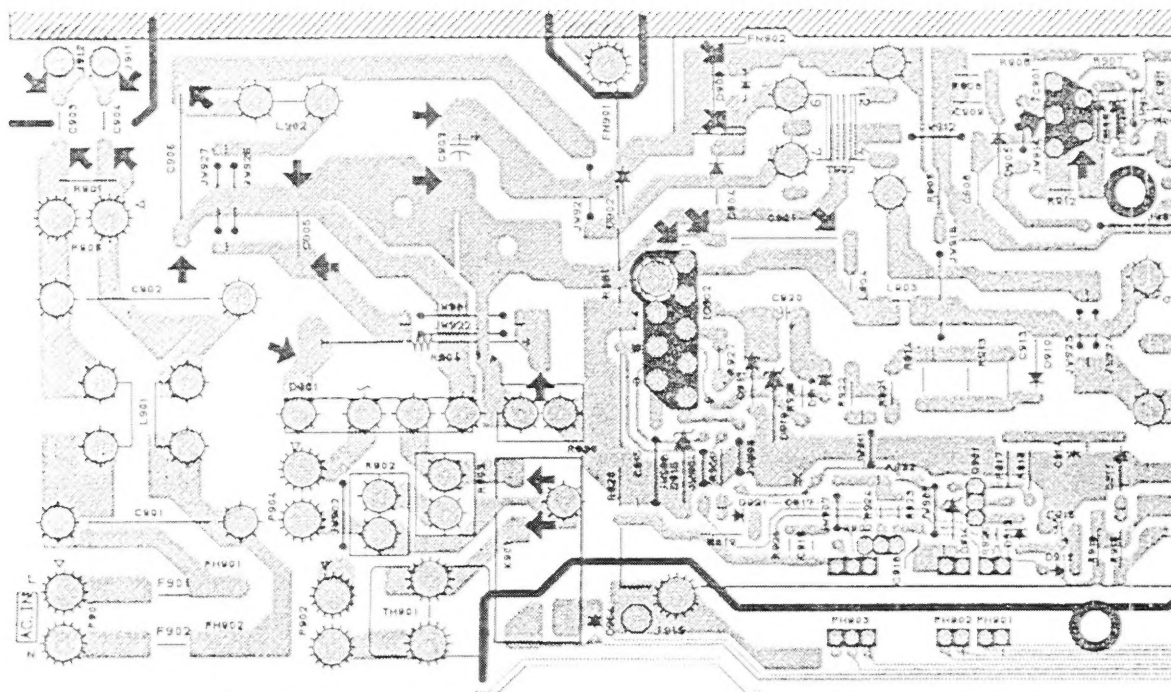
STANDARD

SOLDER PLOT

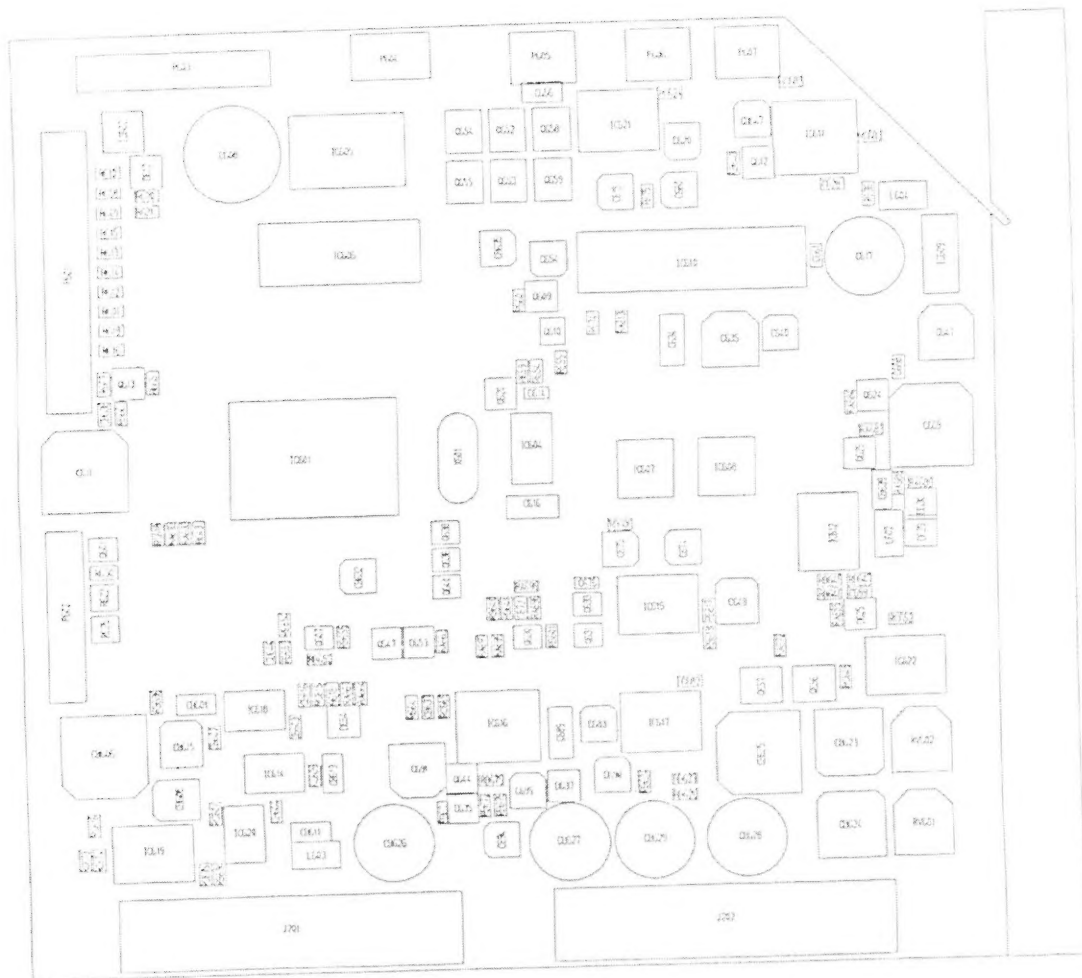
DISPLAY MONITOR

Printed Circuit Board

ViewSonic Corporation



PARTS SIDE



FLOW SOLDERING SIDE

SECTION 11 EXPLODED VIEW and PARTS LIST

Model#: PT810-3

The components identified by Δ are critical for safety.
Replace only with code number specified

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
1	bezel assembly	PBE20-15A	9U62028-00	
2	logo label	ViewSonic	9U32542-00	
3	include bezel assembly		9U59071-00	
4	include bezel assembly		9U59308-00	
5	SW board assembly		7S82129-65	
6	tapping screw (BV)	3.0dia x 8	9ZC3607-00	
7	CRT	M50LJG39X28	9T03755-00	Δ #
8	Deflection Yoke (integrated in CRT)			
9	HV cable holder	3-704-372-01	9W70404-00	
10	Degauss coil	PCL63-11	8F81440-00	
11	CRT shield assembly		9U70398-04	
12	frange tapping screw		9W36503-00	
13	shield VFA		9U70396-02	
14	Video board assembly		7S82129-50	#
15	shield VS		9U70391-00	
16	shield cover		9U70394-03	
17	cover		9U61017-00	
18	tapping screw (BV)	4x16 F-NI	9Z03682-00	
19	stand assembly	PMM20-19	9U69062-00	

REF. NO.	PARTS NAME	DESCRIPTIONS	CODE NO.	REMARKS
20	bracket D		9U69055-00	
21	SW regulator board assembly		7S82129-40	#
22	Deflection board assembly		7S82129-45	#
23	MCU board	MCU16-A40	9T19240-04	Δ #
24	tapping screw (BV)	3.0dia x 8	9ZC3607-00	
25	bracket MCU		9U70392-00	
26	VF assembly		7S82129-35	#
27	holder core		9U69056-00	
28	AC inlet	AC-P03C505	9T89119-00	
29	tapping screw +ext.tooth washer	4.0dia x 8	9Z03677-01	
30	shield D		9U70393-02	
31	CRT GND ASSY		6C88830-00	
32	PWM Board assemble		7S82129-25	#

NOTE

The construction parts of an assembled parts are indicated with a collation number in the remark column.

